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APRIL 1925

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Table of Contents for April, 1925

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		Page
"Scotty"	A. P. Terhune	209
American Forest Week		212
White-Robed Shadbush	S. F. Hamblin	215
The American Beaver	G. C. Goodwin	217
Ant Cooperation	B. Morehouse	219
Singing Insects of Japan	W. Cockerell	220
In the Wake of the Glaciers	P. G. Howes	223
The Grebe That Forgot to Fear	B. H. Lampman	226
Beech Tree Prints Initials		227
When the Waters Break Loose	C. F. Talman	228
Metamorphosis of the Spring Frog	E. A. Preble	232
Coyote, the Prairie Wolf	W. L. and I. Finley	233
Story of the Box Huckleberry	E. T. Wherry	238
Antics of the Puss Moth	F. B. Atkinson	240
Town Forests	H. A. Reynolds	241
The Best of the Camp	E. F. Bigelow	244
Beauty in the Desert		246
Evening Skies in April	I. M. Lewis	247
Tricks of "Trade" Rat		248
Save the Dogwood		249
Practical Nature Puzzles	E. L. Palmer	250
Nature Study Review	A. B. Comstock	252
Nature News and Views		254
Hints to Nature Readers		255

NATURE MAGAZINE is published monthly by the American Nature Association
Entered as second-class matter, March 4, 1924, at the Post Office at Washington, D. C., under the Act of March 3, 1879

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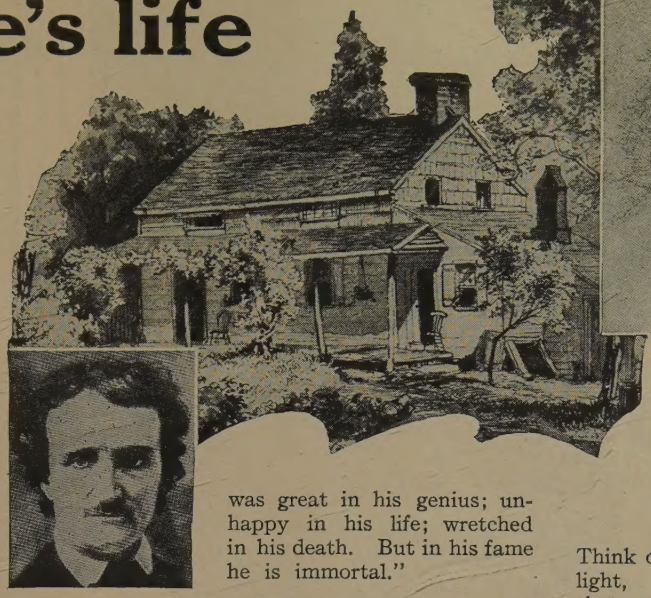
Publication and Editorial Office, 1214 16th Street, Washington, D. C.

The supreme love
and the supreme tragedy
of Poe's life



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Virginia, Poe's wife, and the inspiration of "Annabel Lee," from the water color sketch by A. G. Learned. At left, the Fordham cottage as it looked when the Poes lived there. Extreme left, portrait of Poe in his room at the University of Virginia, photo by Holsinger. Pictures by courtesy of The Mentor.

"For the moon never beams without bringing me dreams Of the beautiful Annabel Lee"

IN his hauntingly beautiful poem, "Annabel Lee," Edgar Allan Poe immortalized his love for his "child wife," the gentle, delicate creature whose devotion furnished the one bright chapter in his ill-starred life.

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Chilling and killing my Annabel Lee."

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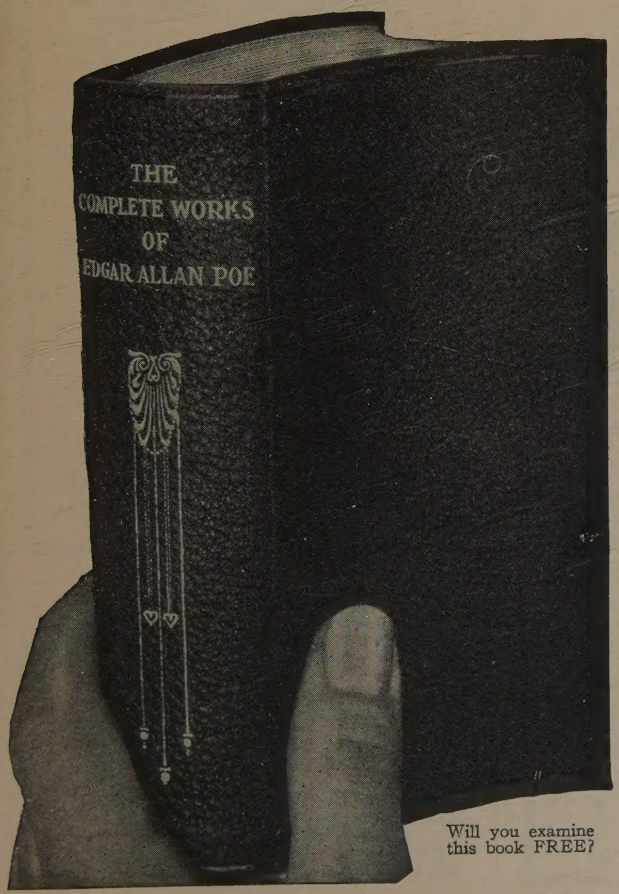

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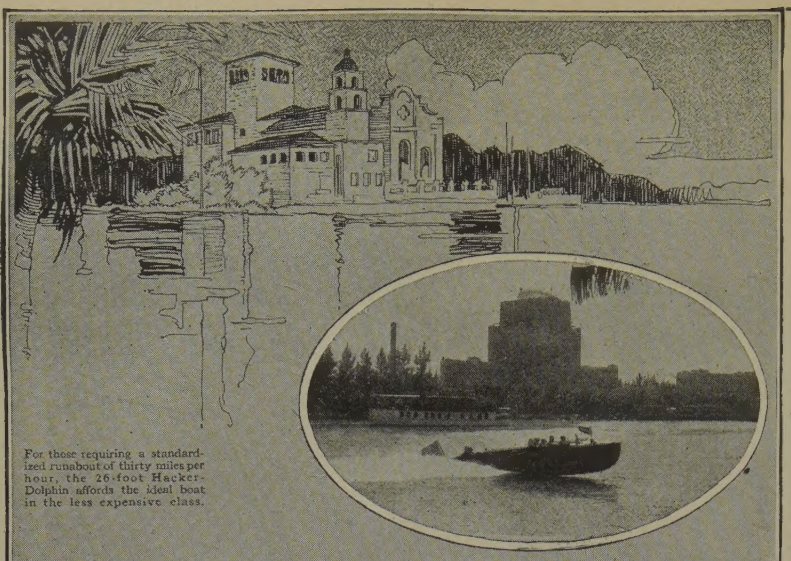

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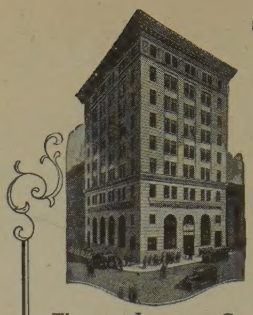

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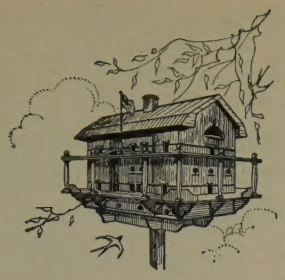

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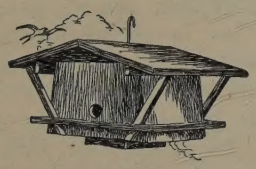

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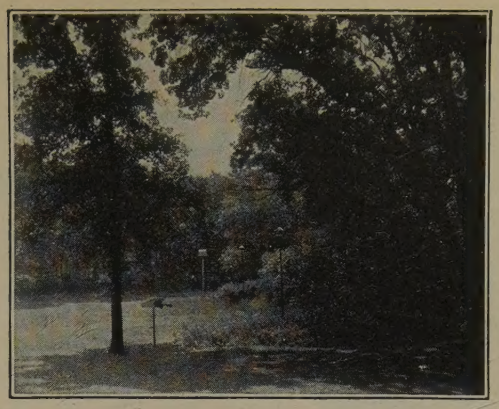

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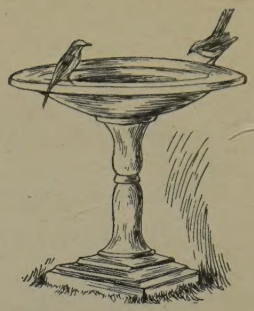

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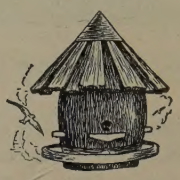

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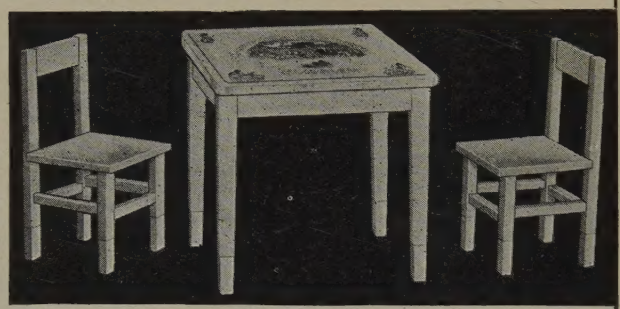

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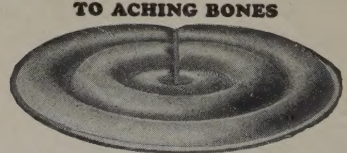

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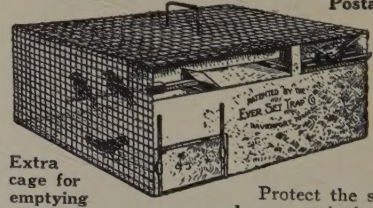

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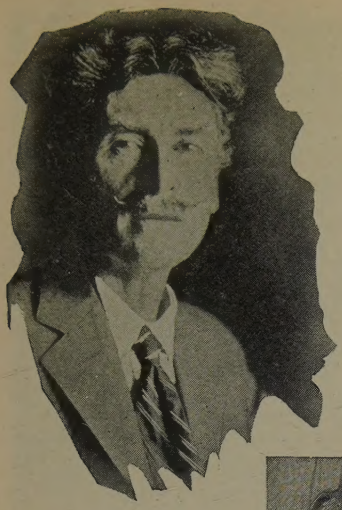

Famous Naturalist Discovers That Animals Know and Obey the Ten Commandments

Ernest Thompson Seton finds that birds and beasts live according to the same standards of morality that guide all upright men and women, the world over. Does this mean that the Laws of Moses are therefore fundamental laws of nature, instead of merely rules for human conduct? Was Moses one of the greatest observers of Nature who ever lived?

IT is well known to everyone who has studied the world's religions that "The Ten Precepts of Buddha" are strikingly similar to "The Ten Commandments of Moses." In fact, the moral code of every primitive race—even of the most obscure African tribe—recognizes theft and murder as crimes, abhors "false witness" against a neighbor, and frowns upon the man who "covets" his neighbor's property, including his wife. It is therefore perfectly obvious that these instincts of justice are the foundations of all human law.

But now Ernest Thompson Seton has gone a step farther. He makes the startling statement that the animals also *know* and *actually live by* the same broad principles of conduct that Moses laid down to guide the children of Israel in their conduct to each other.

Mr. Seton declares that a bear knows by instinct that it is wrong for him to steal from his brother bear—and that the growl of a dog with a bone is really a warning to other dogs to respect the command, "Thou shalt not covet!" All animals, says Seton, have an instinctive horror of murdering members of their own species. They also abhor liars. He gives a striking illustration in which a pack of wolves showed their dislike of lying by punishing a member of the pack who gave "false witness."

These are indeed absorbingly interesting revelations, if true. They open up many fascinating speculations, such as—How did the human moral code originate? Was it revealed from heaven, or is it inherent in all animal life?

But Seton's Proofs Are Even More Fascinating

For over thirty-five years Ernest Thompson Seton has made notes of the behavior of animals in all sorts of situations—and from these wonderful records he has collected many instances which actually *prove* that the wild creatures do really observe and enforce among themselves exactly the same moral laws that govern men and women today.

He even gives examples showing that all the higher animals are striving for a form of marriage that will enable them to observe the *seventh commandment!*

These striking episodes of animal life are wonderfully interesting whether you believe in Darwin's ideas or are a Fundamentalist, and if you are a nature-lover they will give you a fresh, vital interest in the lives of all wild creatures.

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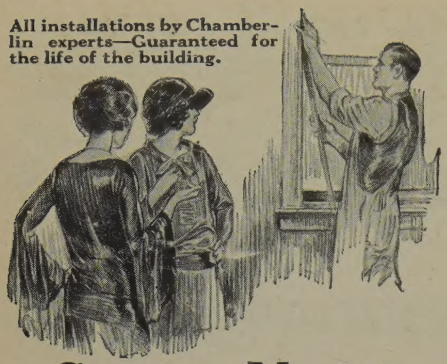

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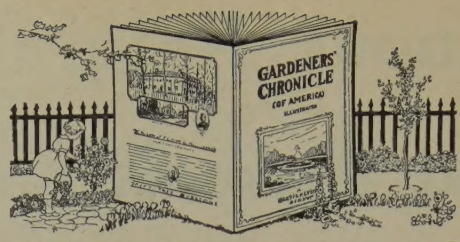

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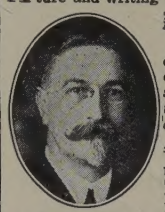

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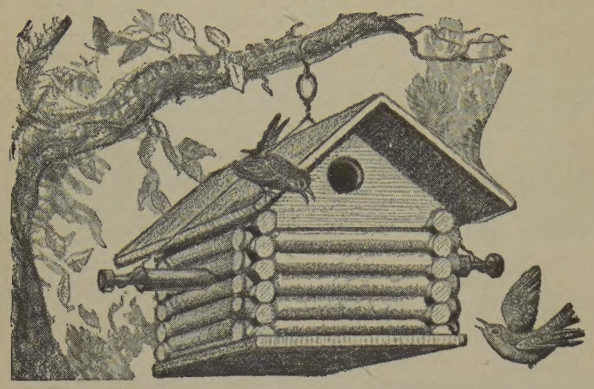

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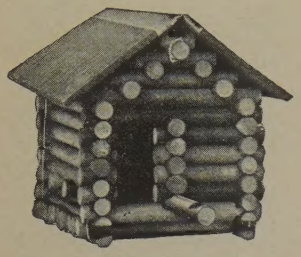

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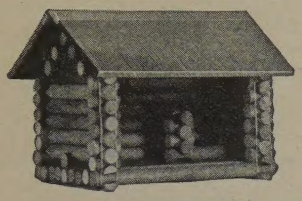
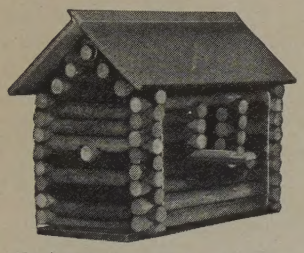


This shelter has the wide side opening which the Robin demands.



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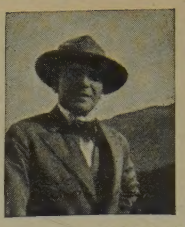

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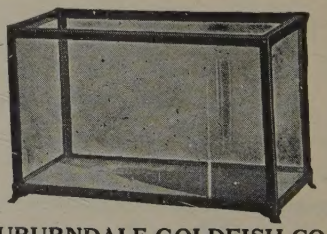

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Nature Calendar

APRIL

> "Go in the capricious days
> Of April, and hunt violets;
> Read Nature like the manuscript of heaven,
> And call the flowers its poetry. Go out,
> Ye spirits of habitual unrest,
> And read it, when the fever of the world
> Hath made your hearts impatient, and if life
> Hath yet one spring unpoison'd, it will be
> Like a beguiling music to its flow."
>
> —*N. P. Willis.*

Of the violets blooming now you may find the Sweet White Violet in the wet meadows or woodlands, the Lance-leaved Violet on the river banks and the pale golden Round-leaved Violet by the wayside.

The Spice-bush is a glowing mass of golden blossoms.

Another touch of yellow in the spring landscape is the Forsythia bush with its bright golden bells.

Marsh Marigolds are blooming in swampy places. The flower looks very much like a buttercup.

The pussy willow's flowers are fast disappearing and developing into green caterpillar-like seed pods.

Elm trees are in flower. The inconspicuous reddish-brown clusters of little blossoms often are unnoticed.

At this time when the Shad begin to ascend the tidal streams the bushes which bear their name are covered with pretty white blossoms.

Daffodils are blooming in the garden.

Spring Peepers are still singing in the marshes but some of them now confine their vocal powers to late afternoon and night.

Water Striders skim over the surface of still ponds. The sun shining through the surface film which supports them is reflected on the bottom of the pond.

Bees must fly high to gather pollen from Maple Blossoms and from the catkins of Willow and Alder.

Lady-bugs are coming out from crevices and from under loose flaps of bark where they have congregated for the winter.

Spring Canker Moths are flying about in the woods. The wingless female lays her eggs on the twigs of trees.

If the atmosphere and weather conditions are right you may see how the air is filled with insects in their spring flight.

The first of our Cabbage Butterflies are flying about. These may be entirely white, lacking the black spots.

Under logs, stones and other sheltered places on the ground are found Black Beetles. Occasionally associated with them are the Millipeds.

Queen Wasps are looking for suitable places to build their nests.

Queen Bumble-bees and Yellow-jackets are hurrying from flower to flower gathering the first nectar of the season.

One of the first butterflies to appear in the spring is the Common Blue.

Crayfish have come out of their winter quarters and are hiding beneath stones in the stream.

About this time the home of the Raccoon has from three to six new occupants. Usually they number four.

The young of the Red-fox look very much like kittens when born except they are about twice as large.

Woodpeckers have begun their spring drumming. By this performance the male accomplishes two purposes. He expresses his love to a mate nearby and he frightens insects from their retreats in the limb he is drilling and thus secures a good meal.

Great Horned Owls provide quite a varied bill of fare for their voracious fledglings. We found one nest stocked with a weasel, two rabbits, a domestic pigeon, two rats, and a meadow mouse.

Prepared for Nature Magazine by the Cleveland Museum of Natural History

NATURE MAGAZINE

Vol. V APRIL, 1925 No. 4

"He who knows the most, he who knows what sweets and virtues are in the ground, the waters, the plants, the leaves and how to come at these enchantments, is the rich and royal man."—EMERSON.

"Scotty"

By ALBERT PAYSON TERHUNE

(ILLUSTRATED FROM ORIGINAL ETCHINGS BY MARGUERITE KIRMSE)

WITH FOUR of the largest and most formidable of our Sunnybank collies, I was walking along a country road. Out through a gateway galloped sturdily a shortlegged dog that could have run with ease under the stomach of any of the four collies, without touching their long underbody-hair.

He was black and rough of coat, black and brilliant of eye; prick-eared and with ridiculously short and stubby legs. At that special moment he was bent upon wholesale destruction. He had dashed out into the highway with the very evident intent of thrashing unmercifully every one of those collies.

He flew snarlingly at the throat of the nearest

of them—Sunnybank Wolf, who could thrash his weight in tigers. But unluckily, the tiny hero's short legs would not carry him high enough in air to get a grip on Wolf's throat. He leaped and snapped in vain. All the time, Wolf stood with wagging tail, looking amusedly down at the black atom of ferocity. From Wolf, the trouble-hunter flew at Sunnybank Gray Dawn and then at Sunnybank Bobby, and then at Lochinvar.

The same bad luck awaited him with each. To save his valiant little life he could not reach the throat of any of them. Nor could he rouse them out of their amused tail-wagging pose and make them fight back. Disgusted, he turned aside and gave up the hope of quadruple battle and destruction.

At first I was inclined to laugh at his ludicrous efforts. Then I felt more like taking off my hat to him. Would Jack Dempsey have the courage to do voluntary battle against four giants, thirty feet high and weighing a ton apiece? I think not. Yet that is what the fearless Scottish Terrier had just attempted.

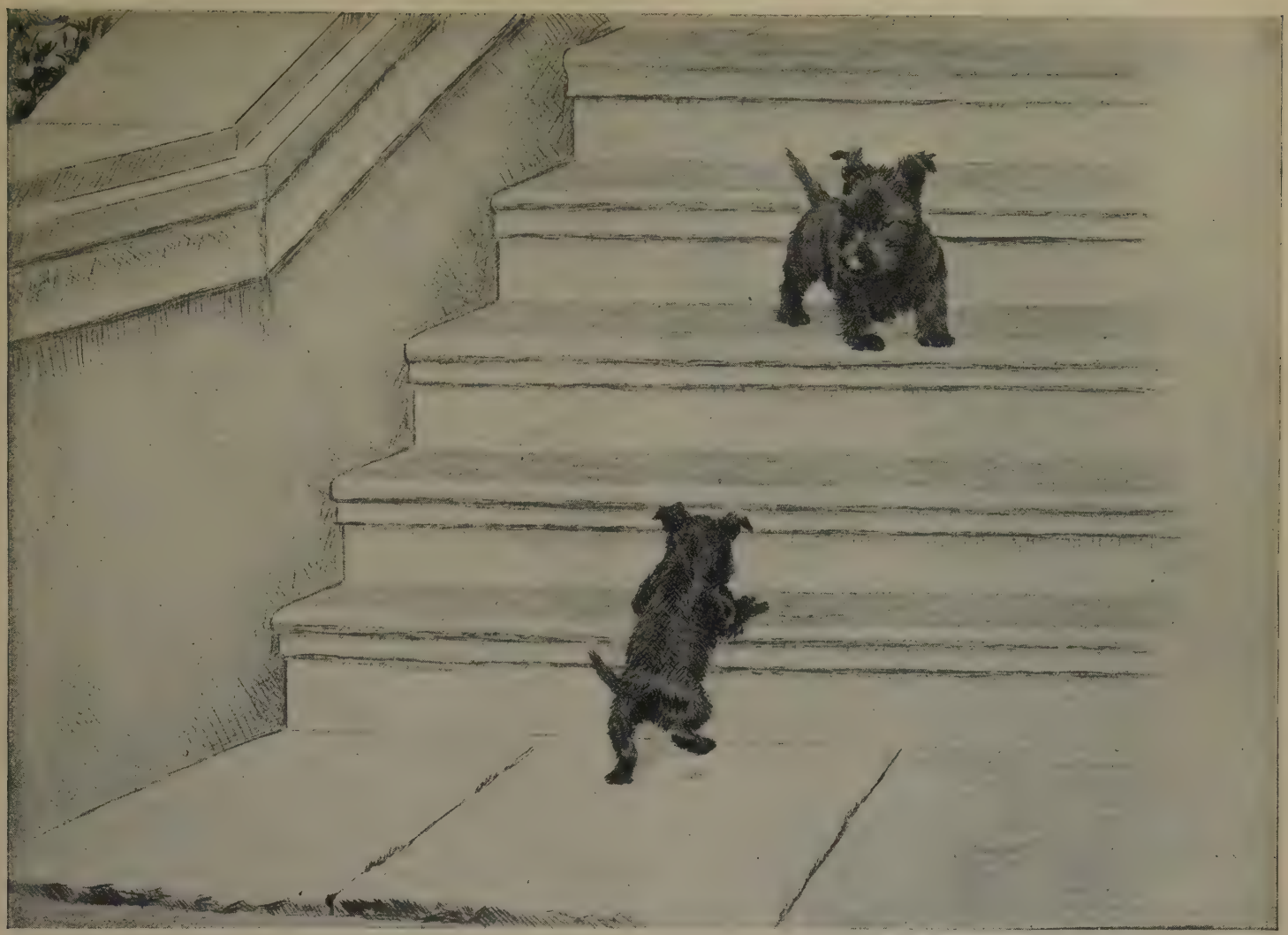
He had dashed forth to wage single-handed war against four giant dogs, any one of which could have killed him at a single shake. Fortunately for him those four dogs happened to be collies of a breed which, almost without exception, will not attack a small dog nor resent his assault. But the Scotty's courage had been no less sublime.

Nor was this an isolated case. I have never yet chanced upon a Scotty, however old and feeble, that would not face battle and death at the most impossible odds. The Scotty is a pigmy with the heart of a lion. He knows no fear. He knows no treachery. My four dogs could have killed this mite with entire ease. Yet as long as he had had the breath of life in him he would have fought on. That is the Scotty of it.

I have spoken of the Scotty's legs as "ridiculously short and stubby." I had no right to do so. Nothing is ridiculous that is made, by Providence, to achieve a definite purpose. The Scotty's legs, and the rest of him, are fashioned for a very definite purpose, and one that dates back for many centuries. Here is the idea:

The Scotty is a terrier. The word "terrier" is from the French "Terre," and from the Latin "Terra." A terrier thus is an "earth" dog. In other words, he is built to dig into the earth with his stubby paws and to penetrate the underground lair of his prey.

An article on the "Scotty" would hardly be complete without illustrations by Marguerite Kirmse, whose etchings and paintings of this dog are widely known. NATURE MAGAZINE *is particularly fortunate in having such illustrations for Mr. Terhune's article this month.*



Into the stony "earth of the wiliest and fiercest fox, the Scotty can force his way, there to attack and kill and drag forth the den's lurking occupant. No collie or other large dog can do that. Yes, and whatever the odds against him, the Scotty will plunge eagerly into the hole of badger, otter or fox, Down there he may well lose his life. But he will lose it fighting with every atom of fight that is in him. He will not sneak out beaten and yowling. He will come out dragging his prey, or else he will never come out alive. He is 100 per cent a hero.

Like the collie and like many another grand importation, the Scotty hails from the Highlands. There, for centuries, he has been known and honored. Yet up to about 1880 he does not seem to have carried his fame beyond northern Scotland. By the way, his pet name among his ancestral moors was the "die-hard" terrier. He earned the title if ever title was earned.

Then fanciers from other parts of Scotland and from England took him up, attracted by his courage, his strength, his utility, and by his sunshiny nature as a chum to such humans as had the sense to appreciate him. They called him the "Aberdeen Terrier." But presently all parts of Scotland were claiming him for their own. At last, out of the tangle of a half-dozen temporary names, he became known to the world as the Scottish Terrier, a term promptly shortened by colloquial use of "the Scotty."

It was long before America would consent to welcome this great little addition to its list of imported dogs. Ames and Brooks and others brought over fine specimens and tried to interest their fellow-countrymen in the new breed. But at first they met with wretched lack of success, says Watson:

"There was no getting the public to take to it. It did not attract. . . . Mr. Brooks could not *give* some of his young stock away."

Not till Dr. Ewing of St. Louis had the foresight to go heavily into Scotty breeding and form a local club for that purpose did the tide of public favor turn toward the game little blackish dog of Scotland. Since then he has won his own way to nation-wide popularity. The first pair of Scotties were exhibited at an American dog show in 1883. Not for

another decade or more did America give the newcomer his due, as a chum dog and as an inspired worker.

By the way, he is the smallest of the "working terriers." The standard sets twenty pounds as his maximum weight, and his permissible colors from iron grey to black. More of the black, or almost black, are found nowadays than the iron grey. Watson decrees his height as "from nine to twelve inches" at the shoulder.

Like many another "working" dog, the brain which made him a worker has also made him an ideal chum. Alert, affectionate, brave, wise, he has won his way into a thousand owners' hearts. Also he has more than justified the maxim the northland Scots used to apply to him: "Guid gear gangs in mickle bundles," a proverb we have transposed long ago into "Good things come in small packages."

Small enough for a house-dog, even in big cities, yet he has not one taint of the lapdog about him. It is no fault of his that he is tiny. If his body were as big in proportion as his heart and his soul a two-car garage would be a too-tight kennel for him. He is a real dog, every inch of him—one of the best.

I was speaking about the Scotty that rushed out of his owner's grounds to assail my four collies. A week after his unsuccessful effort at demolition, his owner telephoned me in dire distress. The Scotty—Roddy was his name, as it is the name of nearly half of the Scotties I know—had been growling manfully at the rear wheels of a huge ice-truck at his owner's back door when the truck had backed over his nose.

Both upper and under jaw were not merely broken. They were crushed. Two vets were sent for in a rush, and I went over to see if I could be of use. I found Roddy sitting up gravely in a basket, his foreface indescribably shattered. Not a whimper escaped from him to tell of his unbearable pain. The vets arrived. One look at him, and they said in unison that he must be put at once out of his anguish. There was no hope for him. Never again could he use his jaws. Inside of three days, a torturing fatal blood poisoning must set in.

The little dog kept his sharp black eyes solemnly on mine as the verdict was given. There was something in that unwhimpering appeal that got under my skin. I bade the vets get to work on the smashed jaws. I told them that no doctor would suggest killing a human patient whose jaw was broken; and I demanded the same treatment for Roddy that would be accorded to myself in like straits.

Reluctantly, the vets went to work. For two hours they toiled most skillfully over him, setting, splinting, binding. At the end of the time his foreface was one hideous mask of bandages. Through the front of these plastered bindings, at my request, they opened a hole through which liquid food cold be trickled down his throat through a medicine dropper. Then they departed, cheerily prophesying he would be dead in three days.

Three months later, my dogs and I walked past his home. Out charged Roddy, fuller of battle than ever (his jaws as good as new), to try once more to lure my collies into mortal combat with him.

The vets' skill had done much. But it was the dauntless Scotty heart of him that had pulled him through.

Observe American Forest Week

"LET US apply to this creative task the boundless energy and skill we have so long spent in harvesting the free gifts of Nature. The forests of the future must be started today."

These are the words of the President of the United States in his proclamation calling upon all citizens of this nation to observe Forest Week from April 27 to May 3, then dedicating themselves to the task of learning "to tend our woodlands as carefully as we tend our farms."

Taking an active part nationally in making American Forest Week a success, the officers of the American Tree Association and the American Nature Association earnestly call upon the membership of these organizations to bend every effort in this direction. Charles Lathrop Pack, president of both associations, declares that the call to arms can not be better stated than it has been by Calvin Coolidge when the Chief Executive says in his proclamation:

"We have too freely spent the rich and magnificent gift that Nature bestowed on us. In our eagerness to use that gift we have stripped our forests; we have permitted fires to lay waste and devour them, we have all too often destroyed the young growth and the seed from which new forests might spring. And though we already feel the first grip of timber shortage, we have barely begun to save and restore.

"Our children are dependent on our course. We are bound by a solemn obligation from which no evasion and no subterfuge will relieve us. Unless we fulfill our sacred responsibility to unborn generations, unless we use with gratitude and restraint the generous and kindly gifts of Divine Providence, we shall prove ourselves unworthy guardians of a heritage we hold in trust."

White-robed Shadbush

By STEPHEN F. HAMBLIN
Director, Harvard Botanic Garden

WHEN THE Shadbush blows beside the stream, the shad swims up from the sea. At least this was once true; but the fish seem to come in thinning ranks, while Shadbush still blooms as before white man appeared. The modern interpretation of its flowering is that now is the time to work in the garden in earnest, and from spearing fish we turn to tilling the soil. There are other names for this plant, such as "Shadblow," from the same fish story; "Juneberry," because of its early fruits; "Service-berry," the name of the European species, and variations and corruptions of these names.

The Latin name, *Amelanchier,* is most peculiar Latin, evidently some old European name dug up to cover this group. The plant is found in Europe and Asia, but its real home is America, one of the most striking of our spring shrubs. Nature made it in several sizes and kinds, and botanists have had a merry time making species of them and rearranging them for further confusion. The botany of them is hopeless to a beginner, and science tells that many of the wild plants are natural hybrids. What will happen to it when the plant becomes a serious portion of gardens no one can say.

If you know the plant to love it, your next duty is to grow it as a garden plant. It has all the grace of its cousins, the flowering cherries, apples and plums; is earlier in bloom; free from most of the pests of the rose tribe, and easy to grow in any soil that ever could be called garden. It can be grown from seed or by dividing the spreading clumps, and rare sorts can be grafted on roots of wild plants as readily as is the apple. Its only handicap is its lack of favor, for no shrub will respond more quickly to cultivation. We can have larger flowers, perhaps even double, but the color may always be white, a robe of enchantment for spring evenings, over meadow and marsh. The plant has three special attractions not belonging to the favored cherry or plum. There is a delightful odor to the flowers, a spicy honey fragrance that belongs to the fields in spring. The petals of most species are not short and round, as with apple and cherry, but long and slender with the grace of a five-petalled white forsythia, in ample racemes. The flower mass is abundant, yet dainty. Again, in mid-June the juicy, berry-like fruit gives pleasure to birds and children. Were they larger and more abundant, they would have commercial value. There is great

PHOTO J. HORACE MC FARLAND CO.

ROBE OF ENCHANTMENT

The Shadbush is a beautiful shrub whose only handicap for garden use is lack of favor.

range in flavor, size and productiveness on the various plants, and selection and further breeding would give more astonishing results than those achieved for the blueberry. There is one failing of the fruit—it is often spoiled by a fungus and the attack of some tiny insect.

The chief difficulties of loving the Shadbush come in telling them apart as wild plants and deciding which are the best to cultivate. Certain characters are easily seen and remembered, and thus the whole group can be separated off into three types and thus learned. First, there are the tree-like ones, which, though they may vary from a bush some ten feet high to a real tree of some fifty feet with a trunk of goodly timber size, are rarely sprouted at the base and have a clear trunk. These are of much the same character as flowering dogwood and redbud and are often found blooming with them. At least two species are of this kind, very alike in many ways and ranging together from Maine to Louisiana

and westward to the Great Plains. Because of the larger size and more rapid growth they are the species most cultivated. They are scarcely different for most of the year, yet there are certain constant differences easily seen and remembered.

The name *Amelanchier canadensis* (Downy Shadbush) often goes for both, but this shrub is very erect in its branching, and the opening leaves are densely white on both sides, a character of no other Shadbush. The silky down is found plentifully in the drooping flower cluster. It is usually the first to bloom. The fruit is large, purple and juicy, but the flavor is rather poor. *A. laevis* (Allegheny Shadbush) is very similar but more irregular or spreading in habit, and the unfolding leaves are perfectly smooth and as purple as the new leaves on a tea-rose bush. The flower clusters are loose and slender, without down, and more showy than of the other. The fruit is dark blue-purple, juicy and wholly tasty. In leaf, flower and in fruit this is the better species, but after the fruit is gone there is scarce a difference between them.

PHOTO J. HORACE MC FARLAND CO.

SHADBUSH BLOWS BESIDE THE STREAM

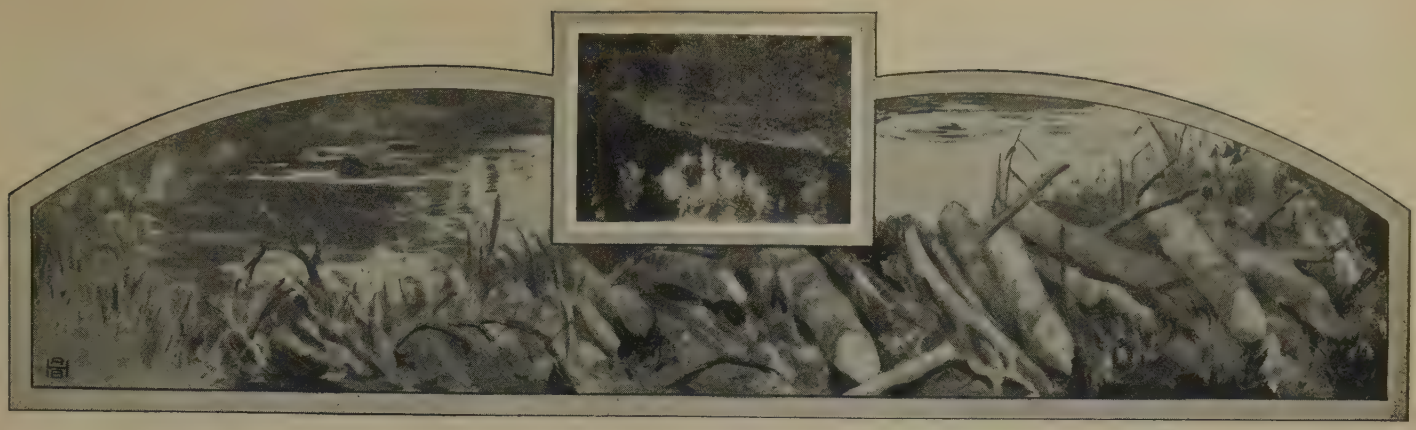
A plant worthy of any garden and worth the while of cultivation.

In the next group are the bushy clumps some ten or more feet high, real thickets, and not at all tree-like. The leaves are more nearly round than on the true tree species. These are excellent flowering shrubs, the clusters often erect. They should be improved for cultivated use. Between the vagaries of nature and the dissensions of man the identity of these three or more species is rather doubtful for most of the year, and some forms are surely hybrids. All are abundant through most of eastern North America, and are easily collected and divided from the woods.

A. oblongifolia (Thicket Shadbush) has a good Latin name, for the leaves are very oblong, very finely toothed and very densely white woolly below when young, but not on both sides as with *A. canadensia*. The flower cluster is very dense and erect, somewhat hidden by the unfolding leaves. The berry is dark blue, bloomy, and very sweet, possibly the best for internal admiration. *A. alnifolia* (Saskatoon) has a broad oval leaf, very coarsely toothed, or toothed only near the apex, and the loose woolly down below soon falls off. The flower clusters are erect, the flowers not as large as of the other, yet showing well. The black berry is only fair in flavor. This species is common in the north and northwest.

A. sanguinea (Roundleaf Shadbush) has its leaf decidedly round, permanently white woolly below. The clusters of flowers are drooping, the petals usually larger than with the other two. The big black fruits are juicy and sweet. As a garden shrub this is the most handsome, and large-flowered varieties are desirable. By midsummer the three are hopelessly identical.

In our northern states and into Canada, particularly in boggy or peaty soil, there are other species whose roots run underground and form patches of slender bushes often only a foot or more high. Of interest to botanists, their habits are against them as cultivated plants, and the show of flower and fruit is not great compared to the taller kinds. *A. stolonifera* (Running Shadbush) has round leaves, smooth above, white below, the flowers and fruit erect. *A. humilis* (Low Shadbush) has oval leaves, and *A. laevis* with its purple baby leaves is the most distinct and useful. Of the bush kinds *A. oblongifolia* has the best berries and shares honors with *A. sanguinea*, with largest flowers, for profusion of bloom. Both are worthy of the improvements of cultivation.



The American Beaver

By GEORGE C. GOODWIN
Of the American Museum of Natural History

(ILLUSTRATED BY A FULL-PAGE INSERT IN COLOR FROM A PAINTING BY R. BRUCE HORSFALL, AND BY DRAWINGS)

NORTHWOOD, in the Adirondack foothills, is a pretty place. The trees were just turning from dense green of summer to gold of autumn. Here and there a few yellowed leaves had already fallen. As the day drew to a close, Lake Hinckley lay still, wrapped in a peace and quiet that made cities seem far away.

It was a silence peopled by little save wild life. It was this life that had brought me here in the interests of scientific research which demanded a close view and examination of several small mammals. Far more interesting it is to watch these inhabitants of the wild at work and play, but my mission this year meant killing. My first two weeks of trapping and gathering brought me specimens in number and variety that astonished the inhabitants of the locality.

Still, I lacked one—the beaver. The busy rodent eluded me. This builder who can fell trees twenty-four inches through, cut thick branches so that the work does not seem to have been done by teeth, and fell his trees into the stream near his dam site, was still missing from my collection. Only an old dam rewarded my searches of inlets and streams. Finally, one night when seeking muskrats I followed the course of a winding brook, climbed a short incline and found my beaver's home.

All around were signs of actual work. Freshly peeled branches were floating about on the water. Up the brook, two hundred feet behind this dam was a second dam, just as big but built more recently. The wood was still quite green and fresh. Leading to both dams through the woods along the banks were little paths, well trampled and worn down, where industrious creatures had cut branches and dragged them to the water's edge to float later down to the dam. No beaver was anywhere to be seen.

In high spirits, I returned to camp for a No. 3 trap, feeling sure that I should soon have a beaver to complete my collection—perhaps two or three. In order to make sure that some beaver would pass over the spot where I placed the trap, I broke open a hole in the dam. This was hard work, for the sticks of wood were intricately tangled, and then were plastered thickly and hard with mud. The beaver is a mason as well as a worker in wood, skillfully using his forepaws to carry mud.

The dam provides sufficient water to insure safety, to provide transportation facilities, as storage for winter supplies and to maintain sufficiently high water level to cover the entrance to the lodges. They are often curved upstream or downstream or zigzag. Green boughs are generally used for material in dam building, and occasionally stones are used. The sticks are usually arranged parallel with the flow, and the upper side is covered with mud and entangling rootlets.

Finally I thought I had done enough damage so that the thrifty and dutiful beavers would have to come to repair their property. Setting my trap beside the hole, I returned to camp for the night.

The next morning I rose with the sun and hurried to the beaver dam. No beavers had come to repair my damage. On the second morning, however, the dam was mended, my trap was sprung, the chain was all twisted up, but no beaver remained. Whoever had come to repair my destruction had evidently been strong enough to get away from a No. 3 trap.

I moved the trap then to the second dam and set it halfway across, where the water was deep, so that, if another beaver was caught, it would be

quickly drowned and hence could neither injure itself nor escape. After dinner at the camp, I journeyed back again, taking up my stand near the dam to watch through the evening.

It was dark at first. Not a sound was to be heard. Recent rains had moistened the banks. In every little corner tiny glowworms crawled along, their phosphorescent lights gleaming. Then, as the moon came up behind the black pine trees of the island, life seemed to burst out of the darkness. An owl hooted in the branches of the tree overhead and two bats went by, playing tag. After a moment's silence, a great splash sounded at the upper end of the dam.

The whole surface of the pool that, a moment before, had been as still and black as ink, became a mass of bright ripples, chasing each other to the shore and lapping under the bank. I strained my eyes to see into those dark shadows upstream, seeking the animals at play, splashing the water and sending it spattering up the banks. Soon all was quiet again. Nine, ten, eleven o'clock came and went. Nothing got into my trap. I saw no signs of beavers, unless that playful pair had been some of the colony.

Next morning, impatient to know my luck, I was halfway across the lake before the sun came up. To watch the faint grey dawn in the east turn to gold in a magic sky was a glorious sight. A slight fog hung low on the still lake. Wild ducks came over in eights, tens, and thirteens, flying low as if to hide in the mist. A great blue heron rose slowly up from the sand as I approached the opposite shore.

Having pulled the boat up on the bank, I started for the beaver dam, about a mile's tramp through the wet grass and briars. Arriving at the little hill beside the dam, I looked down. All seemed quiet. But out in the pool bubbles were rising steadily in one spot—right over the place where my trap was set. Some creature that breathed air was caught in that trap.

Taking a stick in my hand, I waded out to the place where the bubbles were coming up. Mud and sticks from the dam were churning up from the bottom and business seemed pretty brisk with my catch. Although he stayed in the deep water behind the dam, I finally made him out to be a big fellow, held only by one small hind toe. I reached down to hold the chain steady as he came up for air. I seized one leg and, just at that moment, he gave a spring that freed his one toe from the trap. But I held on to the leg I had secured and resolved to keep hold.

"HE TURNED ON ME FEROCIOUSLY, HIS GREAT YELLOW TEETH BARED"

A flop of his big flat tail sent a bucketful of water into my face, and he gave a powerful jerk which pulled me headlong into the water after him. We both disappeared into its muddy depths. He tried first to get into some roots under the water, where he might get purchase enough to pull himself away from me, but I clung to his leg, knowing he could not pull me far. The water was deep, and I, without purchase for my own part, stood no chance if he attacked me. Seizing an overhanging branch, I pulled myself to the side of the dam and, leaning back, succeeded in getting him clear of all the tangled roots and sticks toward which he had headed. Up to my waist in water, I was now on a level with him, on top of the dam. But I had no weapon and could not reach one.

What followed then was just what one might have expected. The beaver realized now that I, not the trap, was his enemy, and he turned on me

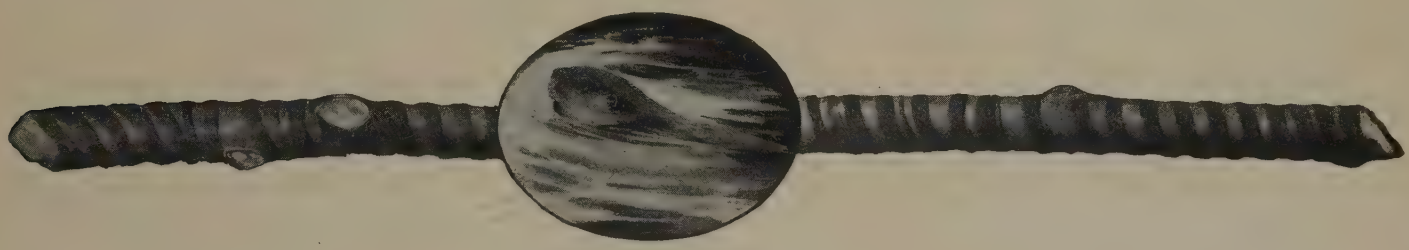
ferociously with his great yellow teeth bared. A moment he eyed me wickedly as if waiting to see just how best to finish me. Then in a fury he bit at me time after time in rapid succession, right at my face. At each lunge to bite, my fist met him squarely on the jaw. These blows soon skinned my knuckles, with no effect upon him. His extra heavy skull is protected by a thick hide and a mass of thick long fur. He made no attempt to get away now, but continued his biting, first on one side, then on the other.

This could not go on forever. My skinned hand was sore, and my blows that received his lunges were growing weaker. I was almost spent, but I realized his strength and knew that a bite from those teeth would crash through flesh and bone like a squirrel cracking nuts. At last, however, he gave up attacking my face, swung around, and bit through the top of my thigh. This wound, I discovered later, was big enough to put my little finger in, for each of his four great rodent's front teeth was nearly half an inch in diameter! When he made this savage bite, however, he gave me the opening I needed. One stout punch in the stomach laid him out temporarily. I afterwards found that that one blow had broken two of his ribs, but that the many bangs on his head had made no impression whatever. I dragged him out on the bank, finished him with my knife, and then sat down for a rest and a smoke, before I could even attend to my severely wounded thigh.

Afterwards, I hoisted him on my back—he certainly was a big fellow—and after several rests got back to my boat. It was lucky for me that most of the way to camp was made by rowing instead of by walking. I was hailed from shore as the boat neared the camp. The fine booty, the mud and dirt, and my otherwise dilapidated state told their own tale.

My prize was a large male, weighing over sixty pounds. How much over I shall never know, for the camp scales registered no higher. All the old residents who saw him agreed that he was the largest beaver that they had ever seen. For my part I shall always have something to remember him by, for his bite will leave a scar on my leg to the end of my days.

"The end of every wild animal is a tragedy," says Ernest Thompson Seton. But how much less tragic than any other probable end was the end of my big beaver! The unusual beauty and strength of this gallant and industrious creature are really preserved for all time at their height. His life has been devoted, in its end, to the cause to which so many human lives are dedicated throughout—the serious and enlightened pursuit of scientific research.

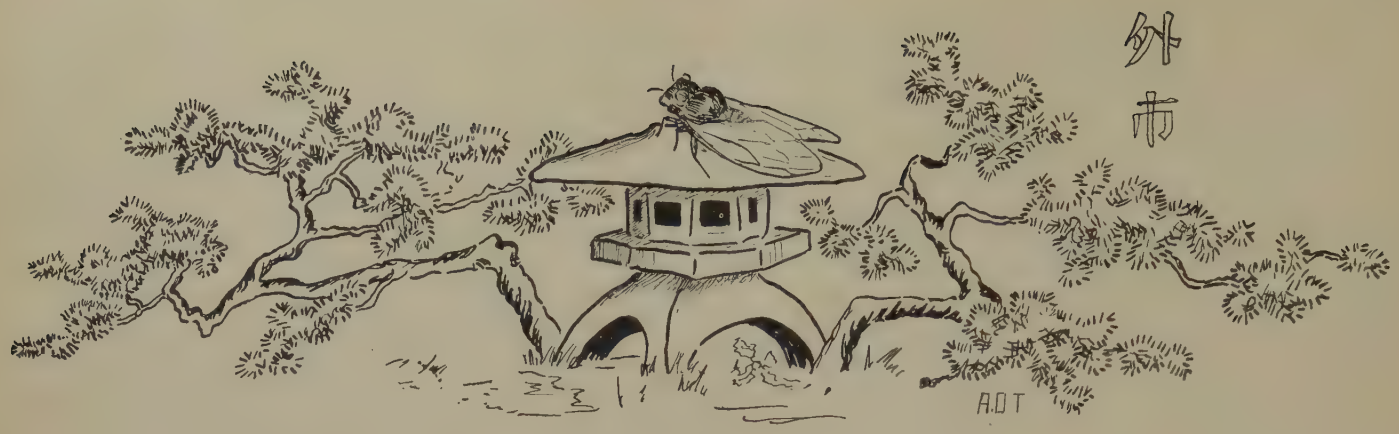


Ant Cooperation

By Bert Morehouse

THE other afternoon a silver moth selected my desk as his final resting place and dropped dead upon it. I let it remain there as an experiment to see what could be the action of three tiny ants, each half the size of a pin head, which immediately inspected the "remains" and scurried away. In about ten minutes the alarm had been spread and, although it was impossible to count them, I am sure that fully one hundred ants, all the same minute size, had assembled for cooperation in a gigantic task. The silver moth would weigh, probably, fifty times as much as the combined weight of the ants.

Then began the work of carrying home the game. Some of the ant couriers outlined the way to where the remains were to be taken. Others hastened about the desk ready to help carry the burden to relieve the workers. Less than one-fourth of the ants carried the moth about a foot on the desk, then new reliefs took hold of it and actually carried it over the outhanging edge, doubled back to the body of the desk, and then down the side to the floor—never once dropping it and never lacking to have new relay-carriers until the floor was reached. At this point it was quickly carried several feet, to where a column of ants were coming in over the doorsill. They relayed their trophy down the steps to an ant hill near by, where their cooperative work ended in a cooperative banquet.



The Singing Insects of Japan

By WILMATTE COCKERELL

(DRAWINGS BY ANNA OPHELIA TODD)

SINGING birds are esteemed in all countries, but it is only in Japan, so far as I have been able to learn, that the musical sounds made by insects are of national importance. So great is the interest of the Japanese in these little singers that they are bought and sold in the public markets. In Tokyo alone there are said to be more than fifty merchants dealing in singing insects. In different neighborhoods picturesque night markets are held and during the long summer months many species of singing insects, belonging to Cicadidae, Locustidae and Lampyridae, are offered for sale. Small cages are provided for these insects, and they are sold over the counters of many small shops and even in the larger department stores. Many are the shapes of these cages that Japanese men and boys fashion from copper wire or small twigs of bamboo. Some are like house boats, some like lanterns, some like boxes; but the most common is the small house of bamboo twigs, favorite both with the boys in the streets and the men in the shops.

The cricket is the first of the choristers of spring, its monotonous and simple tones harmonizing well with the rustic gayety of the awakening world—the world of the germinating seed and unfolding leaf. The cricket is possessed of an admirable instrument for his solemn celebration, and while his relatives, the green grasshoppers can be heard only a short distance, the cricket can be heard across a garden. Later in the summer come the many species of cicadas, the largest with a body nearly two inches long and a wing spread of quite four inches. This large cicada is the loudest of the singers of the summer and fall, but his note has a displeasing, raucous quality, but with a pleasing alternation at times of crescendo and diminuendo. When the trees are full of cicadas it is difficult to distinguish one singer from another, but when the species are put separately into cages the real nature of the music can be analyzed.

The insects that sing at night are even more esteemed than the singers of the day. The gay orchestra of the night has a special charm and poetry, and the cymbals seemed to celebrate a lasting felicity which even man might share by becoming a hearer. Late in September the orchestra singers are stilled, both those of daylight and those of night, although on warm days in October there are occasional soloists, and in the warmth of houses or shop the little singers still furnish entertainment.

It was always a surprise when walking through the streets in the early twilight to hear little whistlings or a sweet, bell-like tone repeated again and again with a delightful insistent rhythm, and whenever I think of Japan I shall think of these delightful singing insects.

"LATER IN THE SUMMER COME THE CICADAS"

Our good fortune brought us back from Siberia to Japan in the week of the "Festival of the Singing Insects," and though we helped to celebrate the Emperor's birthday and saw one of the great gala dances of the

"THE GRASSHOPPER SINGS"

Shosomi Temple, nothing was quite so fascinating or so full of charm as this so-called Festival of the Singing Insects.

The festival is not a celebration as we understand festivals but goes back to the subtler meaning of festival, which is a season that ministers to the spirit. At this time of the year all the cages must be opened, and all the captured insects must be liberated and have some weeks of free life before the frost ends their choruses forever. To be free after captivity must give added zest to life, an ancient philosopher suggests, attributing to insects the same feelings that people have.

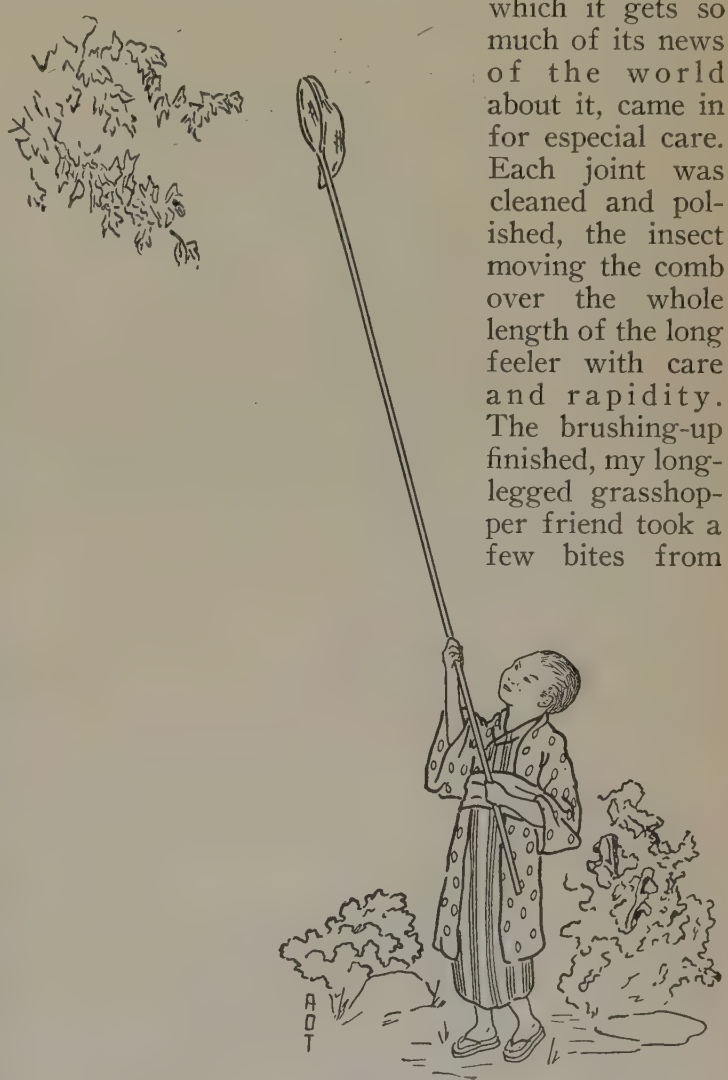
Among my treasures from Yokohama are two cages for insects; the first I bought at a department store, the clerks taking especial delight in finding a highly decorated one for me. I explained as well as I could to the English-speaking clerk that I wanted a bamboo cage such as I had seen the little boys carrying about in the streets. "No can catch," and the gesture with shoulders and hands said quite decidedly that no top side madam would buy such poor little cages. Even the proprietor came to see why I could not make a choice of the cages and offered a reduction in price, and I felt I was making altogether too much stir over a fifty-cent purchase and carried away my much ornamented machine-made cage.

After all, I found a bamboo cage, and in our own garden. I had seen the cook's boys catching cicadas with their tiny nets at the end of a ten or fifteen-foot pole and thought they might have bamboo cages. They had, and were glad to sell me one for twenty sen (ten cents) with four insect musicians inside for five sen extra.

It is interesting to think that centuries ago the Greeks esteemed the cicadas, kept them in cages, gave them for presents, and put charming epitaphs on the graves of favorite cicadas. A favorite among insects seems to most people an anomaly, but it is not so, for these small animals differ almost as much as do pet dogs and cats.

The whole world is indebted to Fabre, who has shown us something of the poetry of insects' lives. There is no place in the world where the beauties of nature play such an important place in the lives of the people as they do in Japan, and, since it is a land of beautiful insects, naturally insects have a very important place in the poetical and esthetic enjoyment of the people. The folk-lore of the Japanese is rich in stories about insects, but the scientific epic as presented by Fabre is also esteemed by many of the educated Japanese.

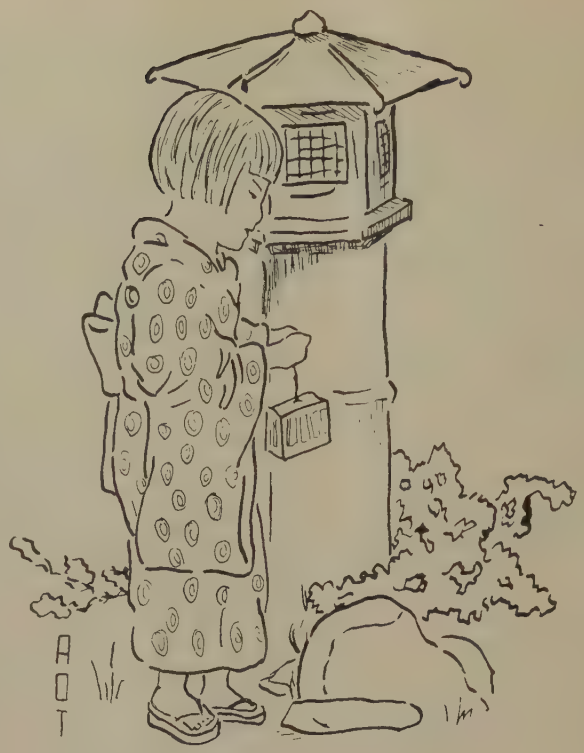
Men who come to the capital on important business often find time to visit one of the merchants who sell singing insects and buy a cage with a singer of a species rare or unknown in his home town, carrying it sometimes hundreds of miles to give joy not only to the children but to the men and women of his village. One of the greatest surprises of a railroad journey in Japan is to see a Japanese in faultless European dress with very correct European luggage, a fine leather suitcase, carved leather portfolio and an insect cage. When we waited at Yokohama for the Tsuringa train, I saw just this combination, and in the tiny copper cage there was a light green grasshopper, very like our American katydid. The cage was just beside me, and the small animal proceeded to make its toilet. The legs were gone over carefully one by one, and the antennae, the radio apparatus of the insect, through which it gets so much of its news of the world about it, came in for especial care. Each joint was cleaned and polished, the insect moving the comb over the whole length of the long feeler with care and rapidity. The brushing-up finished, my long-legged grasshopper friend took a few bites from



"THE COOK'S BOYS CAUGHT CICADAS WITH TINY NETS ON A POLE"

the bit of melon fastened in the cage, and with little squeaks reminding one of the tuning up of a violin player, settled down to his all-night music orgy, not caring that a cage and a railway station held him captive.

Formerly, we were told, parties were arranged to go to places where the little singers abounded, and, extended upon mats, the listeners would pass the night enjoying the harmony of the suzumushi or kusuwa-muchi or matsumushi. All these insects have common or familiar names, and in any country a familiar name is always a mark of affection and esteem. These entertainments no longer occur, but still great numbers of the people have insects in cages,



"MANY ARE THE SHAPES OF THE CAGES"

and in Yokohama I saw many of these beautiful little cages of wire or bamboo suspended under verandas of houses or hung in the shadow of one of the box-like stores.

A recent report says that an insect-collecting expedition found, among several new species, a grasshopper-like animal with a more musical tone than any known insect singer. Almost numberless are the little verses that show the joy that the Japanese have in these small instrumentalists. Greatly the Japanese esteemed Fabre and other men who made scientific researches into the life of insects, and they have the added pleasure which most peoples lack, of real esthetic delight in insect sounds, and the real melodies of Nature that they make.

Arthur Newton Pack, Associate Editor of NATURE MAGAZINE, *and William L. and Irene Finley, our western field naturalists, are now in the southwest in search of new material for our readers. A report from this expedition chronicles a trip into the Santa Catalina Mountains, the Apache Trail and the Roosevelt Dam country. "The desert is full of stories," the Associate Editor writes. The expedition will spend most of its time in Arizona, New Mexico and California.*

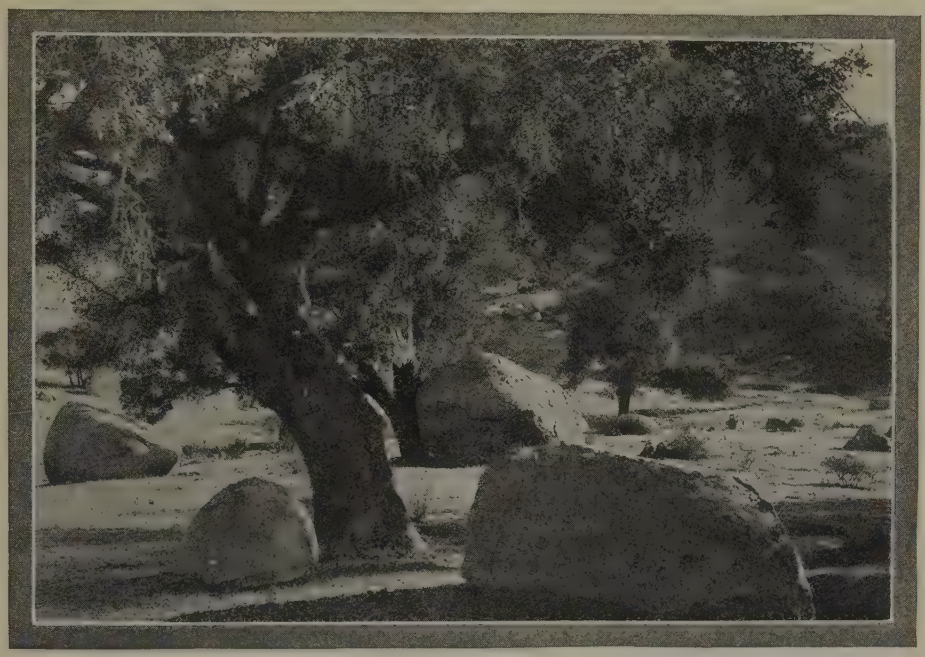
In the Wake of the Glaciers

By PAUL GRISWOLD HOWES
Bruce Museum, Greenwich

(PHOTOGRAPHS BY THE AUTHOR)

TO MANY of us, glacial scars are common sights. It is, however, undoubtedly true that less than one person out of every thousand realizes the significance of these signs. They lie about our fields and houses, along our railroads; everywhere, in fact, over the land that the great glaciers visited. It is one thing to appreciate the beauties of Nature, but a greater joy lies in comprehending and interpreting her offerings. All about us lie these products. Nature's huge open book only awaits the appreciative reader. Her free library may occupy one for a lifetime!

It is startling to realize at the outset that the ice sheets reached a maximum thickness of ten thousand feet. These masses of compacted ice covered all of the northern states at various times in the past, leaving in their wake an indelible record.



TOSSED BY ANCIENT ICY HANDS

Boulders strewn on a California mountainside during the age of the glaciers

Our New England states were vastly altered by the coming of these glaciers. Their true contour lies buried and disfigured beneath a great blanket of glacial debris. Some of these states were originally mountainous where now they are made up of rounded hills. As the ice ground forward with all its terrific weight and irresistible force, the tops of these mountains were sheered off as if by a gigantic plane. Valleys were filled with the debris, and later, when the ice melted, the country was changed completely. Rounded hills filled the place of mountains, their wounds showing as naked places which are our granite quarries today.

The mantle of debris that covers glaciated land is best seen in railroad cuts where it has been necessary to blast a passage through the older rock of the country. We see this mantle as a layer of sand, smooth pebbles, and rocks, of all sizes and descriptions, lying over the original rock below. In gravel pits we see this also, often laid down in layers that become lighter in weight as one ascends, showing that the deposits were probably laid down beneath the water of the melting ice.

Glaciers carried every conceivable size of stones, from minute sand grains to enormous boulders. These lie distributed in the glacier's wake, in meadows, on hill sides and along the beaches, while many great rounded boulders have been left balanced upon level rock exposures over which the glaciers passed.

In the bottom of the great ice sheet these countless imbedded rocks formed a huge rasp that ground and gouged everything beneath them. Softer rock surfaces were scratched and carved like butter by the harder stones of the rasp, and often the teeth themselves were planed like samples of fancy mouldings. In the Bronx Zoological Park in New York City is one of the most wonderful examples of gouged rock to be found anywhere. Here the larger teeth of the rasp cut long, deep channels throughout the surface of the softer material. The smaller teeth made grooves and slight scratches, while the sand and very fine material polished the entire slab almost as though a buffing wheel had done the job. This wonderful sight lies exposed in the ostrich cage, unnoticed by most of the park visitors. Sometimes we find such an exposure with scratches and grooves

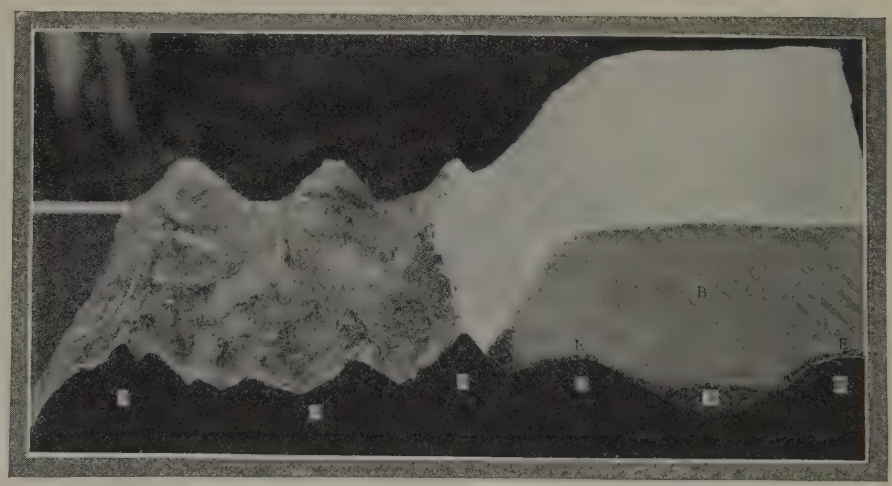
in two directions, telling of the passage of two distinct ice masses.

Such smoothed surfaces as this, even though not scratched at all, are usually due to the passage of ice if they are found in the country over which the glaciers spread. I know of a man in whose front yard lies a large slab of porphrytic granite, carried from who knows where and dropped there by the ice, so smoothly sliced off that the large crystals of orthoclase within it appear as though cut with a sharp-edged knife. Back of the same house, and equally unappreciated, is a fine specimen of gouged rock, a tooth from an ancient glacial rasp.

AN ICE-PLANED ROCK

Probably a tooth from the great rasp now lying on Long Island Sound.

In Connecticut and New York glacial signs are everywhere, for here the ice was nearing the end of its advance. What caused it to melt eventually? No one has probably guessed correctly, but where the melting of the glacier took place we see another interesting result of glaciation. We might call these signs "Till-Islands" or cones, as is really proper.



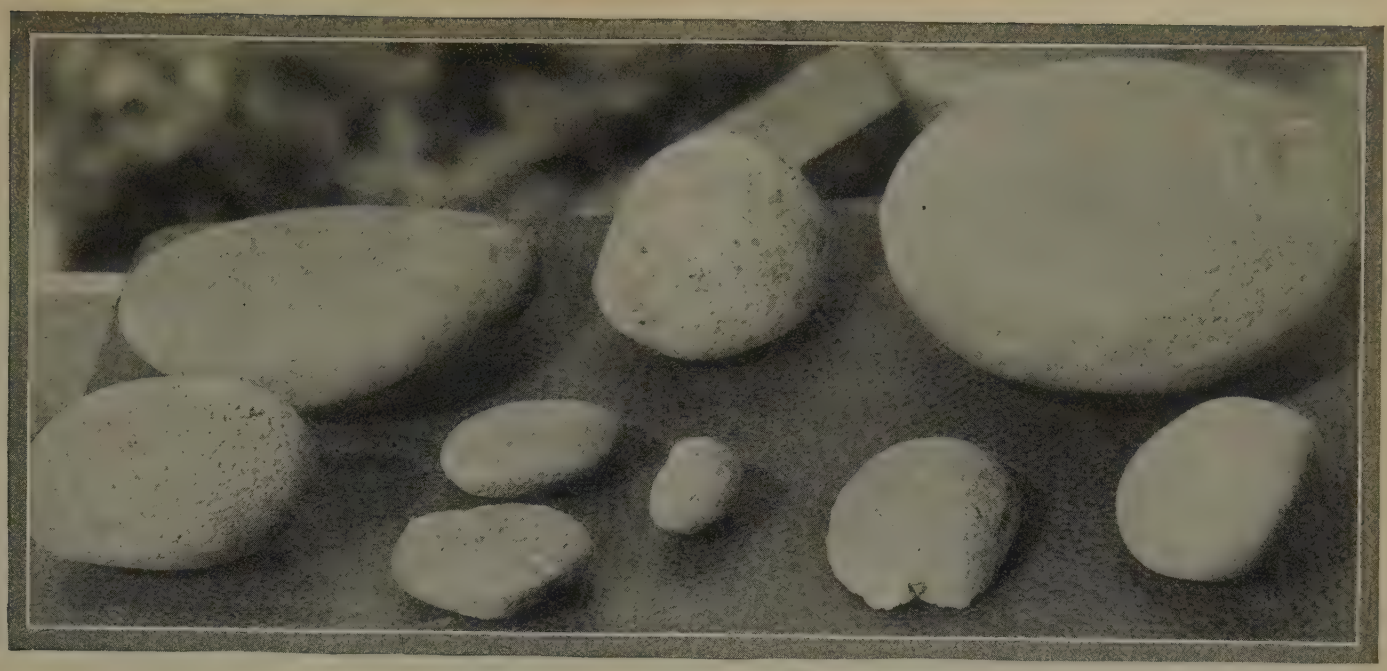
HOW A GLACIER PLANED OFF MOUNTAINS

Model showing: (a) mountain ranges; (b) the glacier; (e) layer of debris; (d) valley filled by the shearing off of mountain tops and (c) the rounded New England hills which resulted.

Within the glacier, as we have seen, were great quantities of worn sand, smooth pebbles and stones, which were gradually concentrated as the ice melted. All this material eventually reached internal streams and was finally expelled through vents along the outer walls of the ice mass. Wherever these streams found their outlets, the sand and stones were poured out. Here they banked themselves against the edge of the glacier. Now as the ice melted still more, its retreat caused these banks to tumble backward, forming more or less coneshaped groups of hills of various sizes. These stand up above the surrounding land in many places, and are recognized by their make-up of finely ground sand and smooth rounded stones of all sizes. Some of these stones are almost spherical and quite polished.

Many masses of ice became more or less deeply imbedded by the sand and other wash accumulating about them. These masses naturally melted last, owing to their protection from sunlight. When at length the temperature became sufficiently high to melt these buried masses, the debris about them naturally fell inward from both sides, thus forming holes whose banks are made up of worn stones and pebbles, and upon the bottom of which large boulders are found, just where they melted out of the ice. These holes sometimes became ponds or lakes in later times, or even small bays opening into deeper water.

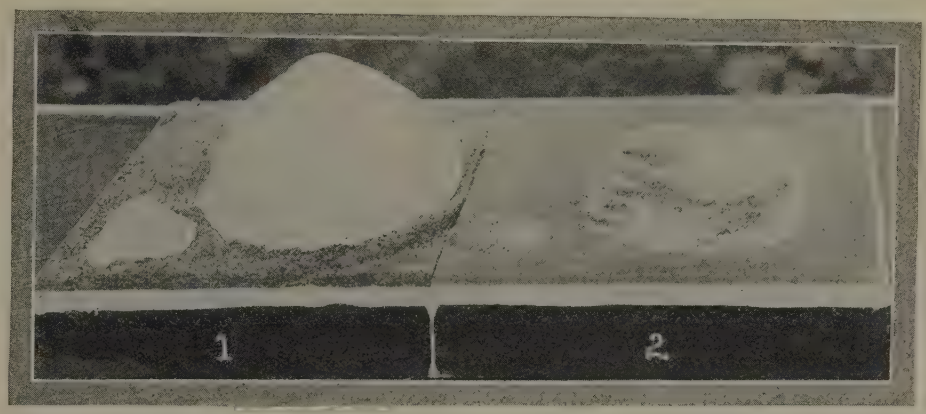
Such holes are geologically known as kettles. The small lakes among the hills of Long Island, for instance, and the fresh water ponds such as Lake Ronkonkoma owe their presence to the melting of glacial ice. Some other typical examples of various kinds of kettles are also represented on Long Island, which is a paradise for the student of glaciation. Lake Success, two miles south of Manhasset, is one, another in Great Pond just south of Riverhead, while a third is Poxabogue Pond, a mile east of Bridgeport.



POLISHED PLAYTHINGS OF A GLACIER

The photograph cannot portray the sheen given to these rocks by the polish of icy hands of centuries passed.

When the ice began to melt in earnest towards the close of the glacial period, floods occurred and formed rivers that would dwarf many of our largest ones today. So great were these torrents that enormous boulders were rolled along like pebbles, and thus transported miles beyond their original positions. Some of these, caught by a turn of fate upon a submerged mass of softer rock, were whirled about, until at length they bored themselves deeply into the softer masses. Some are found today, high and dry, mere rounded fragments of their former selves, in the bottoms of deep, symmetrical, circular wells. Others ground themselves away altogether, leaving pot-holes in solid rock as evidence of what took place.



HOW GLACIERS FORMED "KETTLES"

In (1) land with partly buried ice masses in it: (2) after the ice had melted.

Thus, wherever the great ice masses existed, they left their history clearly written. For hundreds of years these signs, of which I have mentioned but a handful, lay about uninterpreted, a fascinating record of a phase in the history of the earth. Only recently were they recognized in this country as identical with the marks and scars which the great existing glaciers are making today. To Agassiz we owe our recognition of glacial records in America. It only remains as a great wonder, owing to the readable character of these ice scars, that no other man before Agassiz ever realized their significance.

Colorful and fascinating, the Mountain Blue Bird has been selected by R. Bruce Horsfall as the subject for his painting that will be reproduced in color in the May issue of Nature Magazine. These beautiful colored pictures have brought many letters of appreciation from readers, and the editors can promise perhaps even more fascinating subjects for each of the coming months.

The Grebe That Forgot to Fear

By BEN HUR LAMPMAN

MUCK is a fisher of salmon. He spreads his nets, as he has spread them these many years, in a giant eddy of the Oregon shore. And if he glances up from his work it is to see, though he remarks it not, either the cottonwoods here or the cottonwoods across the water on Lady Island. The tireless river rolls between, now green as a queen's emerald, now leaden as storm, and again saffron with silt. And all the cottonwoods are dressed in silver leaf. He gleans what the river may bring, and the river never has failed him. But he thinks of his river always in terms of utility, as many of us think of our lives, and he never has taken his fee from the cottonwoods, nor filled his purse with a sunset cast on the stream. And this is why, doubtless, he does not know that he has tamed a grebe.

Of all water-fowl none is more shy and fugitive than this. Yet there dwells in the broad current between Lady Island and the Oregon mainland, dwells and shines like a sail at sea, a western grebe that is the most unusual fellow of his species. He is amazingly unusual in that he has forgotten to be afraid. If there were a way to speak with the bird one should tell him always to remember fear. He will meet few like Muck, and many whose fingers tingle for the feel of a trigger, and before he has time to repent death may leap at him, and never again would he gleam across the Columbia. For the truce between this grebe and Muck is no stouter than our fisherman's scorn for so unpalatable a fowl. Grebes are not good to eat, and that's an end of it. In twenty years along the river he never has heard of anyone dining on "hell-diver." And so it is that they share the eddy together, those times that Muck runs his nets and cleans his catch.

Along about sunrise the little green skiff bobs beside the bobbing floats, and the net is drawn from the dark mystery of river, and its floundering captives are tumbled into the boat—huge male salmon, fanged as wolves, bright she-salmon, round with motherhood, and those preposterous primitives of ocean, the sturgeons. And tacking across the river, glinting and dipping to the play of the current, swims the western grebe, to enter the eddy as a grebe should enter one—by a dive that is consummate grace and that ends as instantaneously as it began. He is gone. Only the ceaseless weave of the water. He is here.

In his floating boathouse Muck dresses the fish, casting the offal into the current, full thirty feet deep at his feet. He whets the knife and plies it, and sunrise sets the mists to smoking on the stream, and off to the north a stray goose calls. The grebe draws near and nearer in his own way. He dives and reappears. He affects unconcern and dives again. He is alertly nonchalant, if such a thing can be; but presently he is at the very lip of the planking, so near that the fisher of salmon might stretch out a hand and touch the sleek head, were that hand as instant as leven. He feeds there, does the grebe, diving and rising and swimming quite as contentedly as would some fat duck that had strolled from the barnyard to breakfast. Almost he has forgotten how to be afraid.

PHOTO WILLIAM L. FINLEY

"ALL GREBES ARE CURIOUS"

They claim the observer's interest and are in turn interested in him.

Once, when there were no salmon running, nor largess to be had of Muck, he crossed the mile of water to his eddy and looked a question at an angler on the shore. And this is the bird, pray remember, that should dive at the twitch of a hand. Yet when he was thrown a dead chub he did not dive at once, nor did he seem to see the offering. It splashed and sank. For a long minute he rode the current before he deigned to dive, and when he rose again he was a hundred yards downstream, and the gift was in his beak. So sure was he of its recapture—and so confident of pacific intent. And yet the grebe, of all birds, would seem less amenable to such a lesson than any other, because the wildness of primeval blood is his. He is nearer than many to the reptilian ancestry.

It is, of course, the result of an unforgivable canard that the distinguished and graceful western grebe should be vulgarly known as the "hell-diver." Surely this gleaming front of his, that shines in distance like a targe of burnished silver, never has known descent to perdition. And that slim, stiletto head, so nervously alive and alert—how monstrous to infer that it has made obeisance to Eblis. Diver he is, in all truth, but the perfection of his diving warrants a wiser and more comely name than he bears.

All grebes are curious, by habit and to the speculative eye. They are, for all their shyness, no less interested in the observer than the observer is in them, and their apparently random absences beneath the river have often the purpose of bringing them nearer to the watcher on the shore. A long, clean dive downstream, a longer upstream, and, abruptly, one that brings him fifty yards nearer the perilous and forbidden margin. Glance for gaze the bird gives one as it rides the river, its fine head nervously turning. The whorls and traceries of the changing surface are not more gracile than its own contours. The effortless ease of its diving, a half-arc, leaves no least ripple to mark the place or the moment. Shy and fugitive, with that distinctive beauty which characterizes most water-fowl, the western grebe is one of the finest of his family, as he is the largest.

Men taught fear to the grebe. They harried and hunted him for the thick plumage of his breast, so closely thatched as to be resilient, so like the white-gray lustre of plate as to be admired of milliners. The price on his sooty head, with its jowls of silver, was once a silver coin. And even the most stupid of animals becomes fugitive on learning that its death is desired, for reasons best known to its pursuers. Yes, men taught fear to the western grebe, as they have taught fear to many another creature whose death could minister only to lust or vanity.

PHOTO WILLIAM L. FINLEY

THE WESTERN GREBE

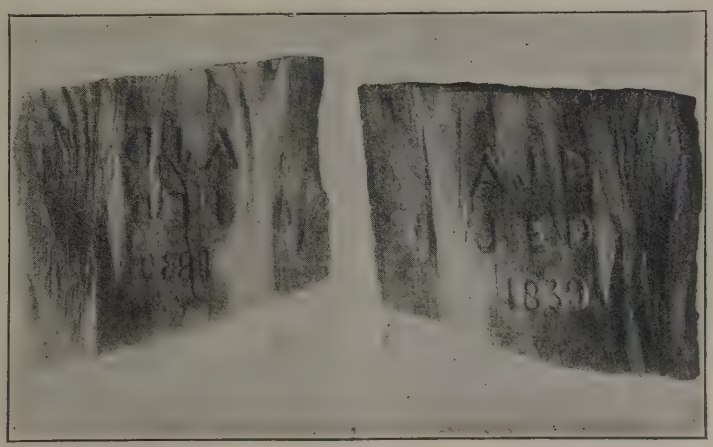
Shy and fugitive with a distinctive beauty like most water-fowl.

There is a pale light of promised rain upon the river and the cottonwoods. A migrant trout leaps to shatter the windless mirror of the eddy. And on Lady Island the cottonwoods are swaying as the first gust swings in, bowing like silver ladies in a minuet. In the far distance the first pearly drops fall. Muck lays his knife aside, and doffs the smeared apron, and gives the grebe a moment's puzzled regard.

"That hell-diver there," observes Muck, "it's sort of funny about him. He ain't afeard of no one."

Beech Tree Prints Initials

JANUARY, 1886, an American beech tree was cut down about one mile north of Morrisville, N. J. On splitting a section of this tree into firewood a remarkable work of nature was brought to light. On one of the pieces of wood were plainly embossed the initials "A. J. D., J. E. D., 1839," and on the other piece were letters and figures exactly corresponding to the embossed ones. A careful examination shows that the tree must have been about 67 years old when the initials were cut. The embossed part was nearest to the bark. It is supposed that the tree, in growing, gradually overgrew the part with the initials cut in it, when its tissue was pressed into the mould-like initials, forming genuinely embossed letters and numerals. Who has a better explanation? What a story of love or romance! The sections of wood are owned by Henry Moon, of Morrisville, Pa.



When the Waters Break Loose

By CHARLES FITZHUGH TALMAN

U. S. Weather Bureau

WHEN we review the catalogue of direful deeds wrought by floods, there is a crumb of comfort in the reflection that the overflows of the Nile and the Mississippi have created some of the richest agricultural soils in the world. When we pay taxes for the reconstruction of public works destroyed by spring freshets along a stream, there is a microscopic grain of consolation in recalling how the swollen waters serve the lumberman by getting his logs down to the mill. One can even imagine a Mark Tapley among the survivors of an engulfed village recalling the historic instances in which inundations have been made to order for the promotion of human aims; as when a valley on the Isthmus of Panama was drowned to form Gatun Lake, and when the Hollanders cut their dikes to repel the Spaniards.

In other words, floods have their good side as well as their bad, but that is no reason why the latter should be viewed with equanimity. Mankind has been too much in the habit of looking upon flood disasters as a necessary evil, when, as a matter of fact, they are almost entirely preventable. It is safe to say that engineers, with half the money at their disposal that civilized nations spend on their armies and navies, could, by methods now known, make such events as rare throughout the world as they are now commonplace.

The overflow of a river in consequence of excessive rainfall is the most familiar type of flood, but there are many others. Low-lying coasts of the ocean are often inundated by so-called "tidal waves"—which have nothing to do with tides in the ordinary sense of the term. Some of these waves are due to earthquakes, others to storms. In the Lisbon earthquake of November 1, 1755, 60,000 people were drowned by a wave eighty feet high that advanced from the sea. The most destructive storm waves have occurred along the coast of the Bay of Bengal. The one of October 7, 1737, is said to have risen forty feet in the River Hugli, sweeping away 300,000 souls. The Calcutta cyclone of October 5, 1864, caused the drowning of 48,000 people. In the terrible Backergunge hurricane of 1876 the water rose from thirty to forty feet in less than half an hour during the night of October 31-November 1, and 100,000 persons perished. Many islands of the Pacific have repeatedly suffered from similar visitations. Our own coasts are not exempt. In the glowing pages of Lafcadio Hearn

WHEN STREETS ARE RIVERS AND ONE ROWS TO WORK PHOTO MIAMI CONSERVATORY DISTRICT

Scene in the Ohio city of Dayton during the historic flood of 1913, reputed the worst in American history.

you may read what happened to Last Island, off the shore of Louisiana, when the waters came in from the Gulf. The city of Galveston has twice been wrecked by mighty waves born of hurricanes; first in 1900 and again in 1915. In the earlier disaster the city lay under from four to sixteen feet of water; property to the value of $30,000,000 was destroyed; and upwards of 6,000 human lives were lost. In both the Galveston hurricanes water was far more destructive than wind, so that these events are properly ranked among the great floods of American history.

Sudden variations in atmospheric pressure sometimes cause the surface of a lake to oscillate in the waves known as *seiches*. As these waves may attain a height of six feet or more, they are an occasional cause of floods along the shores. Similar waves occur on the coast of the Baltic, where they are called *Seebäre*.

No floods cause greater devastation in proportion to the areas affected than those due to the giving way of reservoir dams. The Johnstown flood of May 31, 1889, belonged to this category. Twelve miles up the Conemaugh Valley from the city of Johnstown, Pa., a dam kept back the waters of an artificial lake three miles long and from fifty to one hundred feet deep. Heavy rains, which filled the lake to the brim, burst the dam from top to bottom, and the entire body of water swept down upon the hapless city. The combined work of the torrent and the fires that broke out in collapsed buildings caused a loss of 2,200 lives and property damage amounting to $10,000,000. Shocking as it was, this disaster made an impression upon the minds of the American people considerably out of proportion to its importance. For years after it occurred it was an event from which to reckon time.

Some serious floods are caused by the sudden release of water dammed by ice. To quote the late Prof. Thomas Russell: "The peculiar case of an advancing glacier blocking a stream occurs frequently in Switzerland. In 1818 in the valley of Bagnes, south of Martigny, the winter being very severe, the Gintroz glacier advanced and blocked the Dranse River, making a lake a mile long, seven hundred feet wide and two hundred deep. The ice was pierced artificially and the water about half drained off, when the barrier broke, causing a great flood below. No lives were lost, as the break had been anticipated for a long time. Nearly the same thing occurred in 1595, but with great loss of life." An event more familiar to Americans is the formation of an ice-jam in a river, causing floods above it, and, when it breaks, overwhelming the shores downstream with both ice and water. Certain rivers in Africa and South America occasionally overflow on account of the blocking of their channels by vegetation.

PHOTOGRAPH U. S. GEOLOGICAL SURVEY

BEFORE AND AFTER TAKING

Loaded sacks piled on the dike at Yazoo Delta, Mississippi; then pushed off.

The most notoriously flood-stricken country in the world is China, where the rivers, not content with bursting their banks, migrate bodily over the flat plains. The Hwangho, or Yellow River, has varied its place of discharge into the sea within historic times by a distance of three hundred and fifty miles. It is said that within a period of fifteen years, from 1851 to 1866, the changes in the bed of this river caused by drowning and by the destruction of crops the loss of 30,000,000 to 40,000,000 lives. No wonder this wandering stream is known as "China's Sorrow"!

Melting snows are wholly or partly responsible for a great many floods. An interesting case of this kind occurs in Siberia, where the Obi and Yenisei Rivers flow from south to north for many hundreds of miles. Along their upper courses the snow melts first, and as the water flows down it is met by the water from snow farther north, melting later. The consequence is excessively high water along the lower courses of the rivers.

The tract of land drained by a river is called its *basin,* or *catchment area,* or *watershed.* Of the rain that falls over a river basin, part soaks into the ground, part is evaporated, and part is taken up by vegetation. The rest, by which the river is fed, is called the *run-off.* Statements are often published as to the ratio of run-off to rainfall in extensive regions—we read, for example, that in Europe river drainage is about one-fourth of the rainfall—but such statements are merely averages that seldom apply to any particular river. The actual ratio varies widely, for different rivers, with climate, soil, topography, etc., and it varies also for any one river from time to time with the weather, the state of the ground and other circumstances. Thus if the soil is dry and unfrozen a large percentage of the rain may soak into it, while if the soil is already saturated with water or if it is frozen, most of the rainfall seeks the streams. This is one reason why rainfall is only a partial indication of coming floods. In the case of a large river, with numerous tributaries, the matter is further complicated by the fact that the high-water stages of the tributaries may reach the main river at the same time or at different times, with very different effects upon the latter along its lower course.

PHOTOGRAPH U. S. GEOLOGICAL SURVEY

TESTING FOR THE GATHERING FLOOD

Stop-watch and ear-phones reveal the moods of stream flow.

In their economic importance to civilized humanity, the floods of the Mississippi have usurped the supreme place once held by those of the Nile. The fertile soil of the lower Mississippi Valley early attracted a horde of settlers, while the river itself afforded a highway for the argosies of commerce. Hence the spectacular inundations of this mighty stream took rank long ago among the outstanding wonders of the new continent. Some of the aspects of the floods of pioneer days are thus described by Audubon:

"No sooner has the water reached the upper part of the banks than it rushes out and overspreads the whole of the neighboring swamps, presenting an ocean overgrown with stupendous forest trees. So sudden is the calamity that every individual, whether man or beast, has to exert his utmost ingenuity to enable him to escape from the dreaded element. The Indian quickly removes to the hills of the interior, the cattle and game swim to the different strips of land that remain uncovered in the midst of the flood, or attempt to force their way through the waters until they perish from fatigue. Along the banks of the river the inhabitants have rafts ready-made, on which they remove themselves, their cattle and their provisions, and which they fasten with ropes or grapevines to the larger trees, while they contemplate the melancholy spectacle presented by the current, as it carries off their houses and woodyards piece by piece. Some, who have nothing to lose and are usually known by the

WORK OF A MOUNTAIN FLOOD PHOTO W. R. KING

Tennessee hillside washed by a cloudburst. Well-forested slopes are the best protection.

PHOTO U. S. WEATHER BUREAU

RAILROAD CARS ARE AS TOYS IN THE MIGHTY ARMS OF THE FLOOD

Sweeping down upon Pueblo in June, 1921, the waters, swelled by a cloudburst, wrought havoc in the railway yard.

name of Squatters, take this opportunity of traversing the woods in canoes for the purpose of procuring game, and particularly the skins of animals, such as the deer and bear, which may be converted into money. They resort to the low ridges surrounded by the waters and destroy thousands of deer, merely for their skins, leaving the flesh to putrify."

Today the terrors of the river have been greatly diminished by two means — the construction of levees and the issue of accurate flood predictions. Many plans have been proposed for keeping this unruly stream within bounds, including the building of great reservoirs, the cutting off of bends in the river, the provision of new outlets, and extensive reforestation of headwaters, but the levee system is the only practical solution thus far found. The first levees were built by the plantation owners to protect their own properties. Later the work was taken up by towns, counties, states and the Federal Government. The levees are earthen embankments, averaging fifteen feet in height and eight to ten feet wide at the top, from which they slope to a much broader base. They stand from one thousand to five thousand feet back from the river banks. Though these dikes have cost more than a hundred million dollars, they are still far from complete, and miles of them are destroyed in every big flood. By confining to the channel the water that formerly overflowed, the levees have increased the average height of the river in flood flows. Thus the levees at and below Memphis have caused the flood peaks at that place to rise more than eight feet above their former level.

The inundations of the lower Mississippi River affect at one time or another an area as great as the combined areas of Vermont, New Hampshire, New Jersey and Connecticut—29,000 square miles. When the levees gave way in 1912 more than 12,000 square miles of the valley was inundated; a territory as great as Holland or Belgium.

The prediction of floods and of river-stages in general has been practiced for many years in several countries, and has been developed on a particularly large scale in our own. In this country it is one of the most important duties of the Weather Bureau. Hundreds of river-gauges and rain-gauges are read daily in the various river basins and the readings are reported to more than sixty district centers. Predictions of river-stages are made every day for the navigable streams. In time of flood frequent detailed forecasts and warnings are issued for the regions threatened. In making predictions account is taken of the amount and distribution of rainfall, the state of the ground, the relative readings of different river-gauges along the stream and various other matters. Special rules have been worked for the different rivers on the basis of long experience.

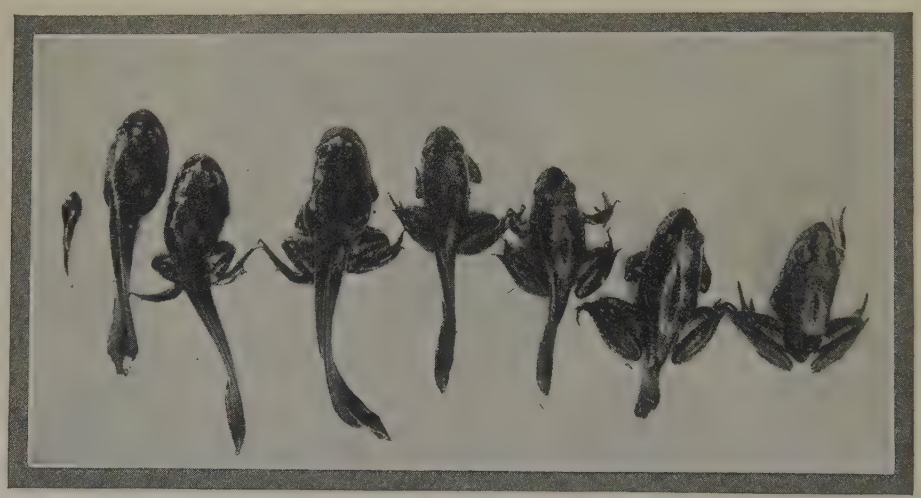
Thanks to the elaborate system of observations maintained along the various tributaries of the Mississippi and the slow travel of flood crests down

that river, the floods of the lower Mississippi Valley are predicted weeks in advance with remarkable accuracy. Thus in the flood of 1903 the exact time when the crest would reach New Orleans was correctly foretold twenty-eight days in advance, and the prediction of the height of the crest at the same place was only five inches in error. These forecasts save millions of dollars' worth of property in each great flood and have almost entirely eliminated the loss of life that once attended such events in this particular region. Accurate forecasts can also be made a considerable time in advance for the lower Ohio, but neither of these exceptional cases represents the possibilities of river-stage prediction for the average stream. There are many rivers whose ups and downs cannot be foretold with any certainty even a day in advance, and there have been many disastrous floods, caused by cloudbursts, the failure of dams or other extraordinary events, which no amount of science or practical skill could have foreseen. Great strides have been taken, however, toward saving loss from floods.

Metamorphosis of the Spring Frog

By EDWARD A. PREBLE

HOW INTERESTING and instructive is this series of photographs showing the gradual change of the Spring Frog (*Rana clamitans*) from the tiny larval tadpole, not long out of the egg, to the fully formed though not yet full-grown adult frog. At hatching, the tiny tadpole has no limbs, and even the tail is absent or very small. The little creature, however, is provided with one or more disks, which enable it to attach itself to the egg mass or to a water plant. It has no mouth, nostrils, eyes, or even gills, and is still nourished by the yolk within its body.



TADPOLE TO FROG

A picture story of the stages in life from the tiny larva on the left to the frog on the right

Gradually the tail grows, the mouth and nostrils open, gills develop on each side of the head, the eyes become visible, and the tadpole, now very active, procures its food from the ooze and silt which adhere to plants and other submerged objects, and on diatoms, algae, and the flesh of dead fishes or other inhabitants of the water. As development goes on, the hind legs appear, small and weak at first, and, as they enlarge, the tail gradually becomes smaller, being absorbed and serving to nourish the animal. When the hind legs have reached considerable size the fore legs, which have meantime developed, break through the skin.

The hind legs sometimes become strong enough to enable the animal to jump some distance while yet the tail is retained. At this stage the frog presents a very curious appearance. Before this time the external gills have disappeared, the lungs have become functional, and the mouth, which has been small and bordered with membranous fringed lips, has gradually assumed the broad serviceable shape needed by the adult frog for catching living insect prey. With this change of food the digestive organs have become altered to meet the changed conditions, and the transformation is complete.

Most frogs change from the larval to the adult state during their first summer, but the spring frog is one which spends its first winter as a tadpole, and is a year old by the time it becomes a fully developed frog. Even at that stage it is scarcely half grown, and another whole year may elapse before it attains to its full body length of about three or four inches.

Coyote, the Prairie Wolf

By WILLIAM L. AND IRENE FINLEY
Of the National Association of Audubon Societies

(PHOTOGRAPHS BY THE AUTHORS AND H. T. BOHLMAN)

THAT FAR-AWAY LOOK

Shep often seemed to be thinking of his ancestors of the desert.

THE HEAT of the afternoon sun shimmered across the gray stretch of sand and sage. We had started out across the high desert early in the morning and the road had led on to nowhere, until suddenly it turned down a dry wash hemmed in by rimrocks. Rounding a point, we startled a coyote hunting for jack-rabbits. He leaped the rock wall and bounded away up the slope, dodging in and out among the sage-bushes as if he expected to hear the spat of a bullet. Nothing happened, so he stopped near the top of the rise, curious to see who had invaded his hunting ground. To the children he looked so much like a lost shepherd dog that they tried to call him back.

Toward dusk a long, drawn-out bark broke the stillness of the desert air. It was like the wail of something lost. Peter, being a canine, pricked up his ears; the children listened eagerly. "Was that the coyote we saw?" they asked. "Perhaps," I answered, "he may have followed along the ridge and is now sniffing the odor of bacon, for such sweet scents send their waves far out and are caught by the sensitive noses of many wild folks."

We gathered some more sage-brush and limbs and the camp-fire crackled. "Did you ever meet a coyote before? Tell us the story," urged the children, as they squatted in the bright blaze.

"Yes, I have seen many coyotes. A coyote or prairie wolf is just a keen, wild dog that wanders around and lives a sort of a vagabond life. He has no friends as Peter has to give him food. He depends upon his wits to outstrip others—and man. With an eternal bounty upon his head, he still lives a happy-go-lucky rover along the borderland of civilization.

"A story? Well, let me see. Some eight or ten years ago we spent the summer down here in Harney County in southeastern Oregon, I took some pictures of a little female coyote named Shep, that a rancher had for a pet. And when I come to think about it, there might be some connection between this coyote I shall tell you about and the one we have just heard.

"Shep's beginning, like her whole life, was just a series of chances. The Scott boys were out rounding up cattle one day at the Double O Ranch when they happened to ride past a hole in the sand. It was larger than a badger's burrow, and when they looked closely they saw coyote tracks nearby. These were the tracks of Shep's mother. The next day the boys returned with a shovel, for they knew that for every coyote scalp they took they could collect a three-dollar bounty. Why? Because some coyotes kill lambs and some steal chickens, and to get rid of these outlaws rewards are offered, just as for the capture of a man who holds up a train.

"But to return to the Scott boys—they dug and dug for nearly fifteen feet till they could see the end of the burrow, and there, crowded in a heap, were seven coyote puppies. Six of these they killed, but the seventh puppy had crawled further back. As he pulled her out by the hind legs, the younger boy remarked. 'You know Brooks said he would like to try raising a young coyote. Suppose we give this pup to him.'

"It was by so narrow a margin of chance that this little coyote's life was saved. The first time I saw her, she had a collar and a chain with a ring at the end of the chain that slid back and forth on a long wire near the side of Brooks' cabin, so that she could run up and down over a space of about fifty feet. Brooks had called her Shep because she had a pointed nose and the build of a shepherd dog.

"As I came around the corner of the cabin, the little coyote ran like a streak to the farthest end of her line. She was nervous and afraid, but I sat down quietly, and after a while she let me get close enough to pet her. A moment only and she was off. Fear was her strongest instinct. Indeed, any sudden noise seemed to throw her into terror.

"Shep's chief amusement and enjoyment were in stalking hens. If a hen approached her limited domain, she would drop flat on the ground as still as an old stick, and patiently wait. But there was no chance of this game working, for Shep was

A NEW KIND OF MOTHER

SHY AS A FOX; KEENER THAN THE WOLF

always brought up short at the end of her chain, and after several rushes the hens learned to know the exact distance. One day she dug a hole and lay crouching down with just her eyes over the rim, hoping that some old fat hen would try to steal dinner from her pan. When Brooks came in from the field

CHICKENS IN THE OFFING

Just beginning to notice the hencoop and its feathered occupants.

that evening, he discovered scattered feathers and the half of that chicken which Shep could not eat buried in the hole for tomorrow's lunch.

"While Brooks was out of sorts about this, he couldn't help but reason that it was partly the old hen's fault, so he let the matter pass that time. But

JUST A HANDFUL

At this age Shep was no problem to hold.

one night he heard a commotion among the chickens and, rushing out, found Shep slashing right and left among a brood of young barred rocks. As he came up with a yell, Shep sneaked around and went back to her box, dragging the broken links of her chain behind her.

"Shep's taste for chickens brought Brooks nearly to the point of collecting the three dollars for her scalp. About that time, a neighbor's boy brought in a big hawk that couldn't fly because the tip of its wing was broken. Shep's mouth watered to see this new kind of a chicken, and she crouched lower than ever. Whether that hawk lacked common sense or merely wanted to show off, no one ever knew. He flapped his wings and strode with dignity into the borders of Shep's playground. With two bounds, the coyote pounced upon him and bore him down, but before she could take a bite, the hawk flopped over with his sharp talons up and caught Shep in the chest with the grip of a steel trap. Shep was half grown and nearly twice the size of the hawk, but when she felt those needle-like

FOR ALL HIS FAULTS, AN ASSET

The coyote keeps in check the squirrels, mice, gophers and other crop enemies.

claws piercing her skin, she let out a yelp and bounded straight into the air. The clutch tightened till the coyote fell over backwards in her frantic effort to escape. She had never dreamed of a chicken like this.

"No, Shep didn't hanker for chickens after that or anything else that was bird-like. And I guess this little incident was what really saved her life as far as Brooks was concerned.

"Brooks kept Shep the rest of the summer and tamed her so she would lead and follow him about, but she feared every stranger with a high-strung, nervous fear. She could be petted, but the instant she took fright she snapped and bit in a frenzy.

"One day during the winter, Brooks started for

town early in the morning and did not return till late that evening. Shep was gone. The catch on her chain had in some way unsnapped, but she still wore her leather collar. A few days later she came back to the cabin and ate the food Brooks had left in a pan, but he couldn't catch her. She ran off across the field and up the rocky slope. Her visits soon became less frequent, and towards spring she disappeared.

"Once a neighbor reported seeing Shep cross the county road and he would have killed her, but he had no gun. He didn't want any coyote raising pups to kill his sheep.

"The next time Shep was seen was late the following summer. It was over to the east on the wide, flat area where the marsh grass meets the sage-brush. Well out in the field toward the lower end where the grass had been cut and lay in scattered cocks, were two coyotes. Shep, the older one, still had the collar on her neck. The younger animal, a little smaller, was hunting mice. He crept up to a haycock, suddenly pounced upon it, then watched to see if a mouse ran out. Looking away to the west, the coyotes saw several men riding down the road with a pack of dogs. Among them were two Russian wolf hounds used for chasing coyotes. It was a strange sight to the young coyote. He stopped hunting mice and sat on his haunches. Shep crept back low in the sage. Motherhood had sharpened her wits.

"The coyotes saw the men cross a little ditch, open a gate and start straight out into the field. As a ruse, they passed some distance to the north. The young coyote was about to resume his hunt for mice, when suddenly the hunting party veered and bore rapidly down upon him. For some moments he watched with interest, then started off in an easy swing. At fifty yards, he glanced back to see what the dogs were doing. They had seen him, and with great strides were gaining rapidly. The little coyote scented danger and began looking for cover. He had been outwitted. The dogs were pressing on to drive him in the open field. The riders had taken a short cut toward the nearest sage-brush cover, the little coyote's only protection. His last chance was to head for a ditch that meandered off toward the gravel road. He was scared and rapidly losing ground. His hair bristled and he bared his teeth, for he would have to put up a running battle. The hounds were closing in. With a spurt, he jumped for the ditch, but dodged sharply to the left, slinking low along the edge of the water.

"The big wolf hounds would have seen him, but just at that moment a little way across the ditch and in plain sight, Shep loped straight away for the road. The hounds cleared the water in one leap and were hard after her. The horsemen, experienced in wolfing, picked out the skulking shape of the little coyote with belly to the ground, sneaking out of sight in the sage a hundred yards up the ditch. It was too late; the dogs were after the older coyote.

"It was now a race of life and death with Shep. Down the road to the south in the big field was the border of sage and safety. It was too far. The hounds would snap her up before she could reach it. In front of her, the ditch meandered on to the gravel road across which was another field with no cover. With a spurt of speed, Shep now tore along the edge of the ditch with no chance for hiding from the approaching pack. Suddenly, in a narrow place, she leaped the ditch and took what seemed a fatal chance. She raced straight across the open corner of the field. But her legs were no match for those of the wiry Russian wolf hounds. In another moment they would throw her, but she slipped under the barbed-wire fence, dodged to the left in the bordering cattails at a point where the ditch and the road met, and then dashed through the culvert under the highway. It was a close race and a narrow chance."

The flicker of the fire had faded. The night had opened like a great book. Across the still stretch of the desert, from far away hills, sounded clear as a bugle the desert "taps" of a coyote.

WILD DOG OF THE DESERT

Always on the firing line, an eternal bounty upon his head.

The Story of the Box Huckleberry

By EDGAR T. WHERRY

THE BOX huckleberry is a beautiful evergreen creeping shrub with a remarkable history. It was first discovered in the mountains of southwestern Virginia in the latter part of the eighteenth century and was later found at two or three other places. One by one its localities were lost sight of, or reported to be destroyed, so that scientists feared that the species was in danger of becoming extinct. Its existence in abundance in southeastern West Virginia was overlooked, through a near miracle, by the botanists of a century. Most curious of all is the fact, discovered during the investigation of its distribution and behavior, that at least one of the patches which it forms, even though it is several acres in extent, represents a single plant, the age of which is measured in thousands of years. It is thus one of the most interesting of American wild flowers.

In 1785 the French Government sent to the United States a noted botanist, F. André Michaux, to collect plants for naturalization in France. He remained here for twelve years, keeping journals of his travels, and making a herbarium, now preserved in Paris. He also prepared a work on the flora of North America. In it there is listed an evergreen blueberry, with box-like leaves, under the name *Vaccinium brachycerum,* with the locality "in Virginia circa Winchester." Asa Gray, America's most eminent botanist, examined Michaux's herbarium in 1839 and recorded that the specimen of this plant is labeled "Warm Springs." However, Michaux's journal does not mention the finding of the plant on his trips through Winchester (which took place at times of the year when it would not have been in flower) nor record any visit to Warm Springs, so we do not know when or where he found it.

PHOTO C. R. SHOEMAKER

BOX HUCKLEBERRY AS GROUND COVER

It should be of value for growing under pine or other trees in sandy, acid or sour soil.

The next botanist to collect this plant was Matthias Kin, a German nurseryman who traveled in West Virginia in 1800. He labeled his specimens "Krien Preyer." Frederick Pursh, a German botanist who settled in this country in 1799, found it in 1805, growing in the "western parts of Virginia, near Winchester and the Sweet Springs."

These collectors all died in the early part of the nineteenth century, and the localities of the plant were lost. Asa Gray took several trips through the southern Appalachian Mountains and tried to relocate the stations from which it had been obtained, without success. However, about fifty years after the original discovery, an occurrence of the species turned up in an entirely different region, near New Bloomfield in central Pennsylvania. It was discovered there by Spencer F. Baird, then a young professor of natural history, later Secretary of the Smithsonian Institution and one of America's most eminent scientific men.

Asa Gray subsequently showed that the plant belonged to the huckleberries, the genus name for which is *Gaylussacia.* These are distinguished by having ten relatively large seeds, whereas the blueberries, or *Vaccinium,* have numerous minute seeds in their berries. Under the usual rules of nomenclature the technical name became *Gaylussacia brachycera,* the colloquial name box-leaved, or box huckleberry.

Many years later a new colony was discovered in Sussex County, Delaware, only to be again lost sight of and thought to have been exterminated. About 1910 a colony was discovered near Pasadena, Maryland, and two years later a group of them was found near Pulaski, Va., but the existence of these did not become widely known until some time later.

In July, 1918, Dr. Frederick V. Coville of the United States Department of Agriculture visited the Pennsylvania locality and was struck by the sharp boundary of the patch, by the uniformity of peculiarly shaped and colored berries through the whole ten acres, and by the entire absence of seedlings in the soil in the vicinity. His experiments in cultivating blueberries and huckleberries had shown him that, in order to produce seeds capable of yielding vigorous plants, cross-pollination from one individual plant to another is essential. He collected and sowed in the greenhouse several hundred seeds, and not one of them yielded a plant strong enough to live more than a few months, so he concluded that the whole patch must represent one single plant, which had spread by means of root-stocks from an original center. As observation showed the average rate of spread to be but six inches per year, the age of the patch could be readily calculated to be at least 1,200 years, representing thus one of the oldest living things.

The Delaware colony having been relocated by the present writer the cross-pollination was tried. Every one of the five seeds produced that summer germinated, and although one of the young plants was accidentally killed, the other four remain alive and vigorous to this day. Moreover, hundreds of seeds have been obtained by crossing in subsequent seasons, and nearly every one has yielded a plant, whereas no permanent plants have ever been obtained from self-fertilized seeds. Dr. Coville's theory as to the individual nature of the patch was thus completely upheld.

In 1920 Mr. H. A. Ward of Harrisburg, Penn-

PHOTOGRAPH U. S. DEPARTMENT OF AGRICULTURE

BOX HUCKLEBERRY IN FLOWER

A wild plant whose delicate pink flowers open in April and which has an interesting history.

sylvania, discovered further occurrences of the box huckleberry in that state near Losh Run, thirty miles from Baird's colony. The following year the first natural seedlings were found by Mr. Harry W. Trudell and the writer, at the locality in southwestern Virginia. Several different patches of the box huckleberry grow here so near together that insects cross-pollinate them, and fertile seeds result.

A copy of an article by Dr. Coville in *Science* was sent by the writer to Reverend Fred W. Gray, an amateur botanist of Cass, West Virginia, and he kept his eyes open for the plant. In the summer of 1921 he discovered it near the village of Dorr and set out to find further localities. Learning that it was known locally as "juniper," he inserted advertisements in local papers and was rewarded by reports of numerous occurrences of it in southeastern West Virginia, as well as in adjoining parts of Virginia. Visits to these places disclosed many acres of practically pure stands of the plant, as a ground cover under white pine and rhododendron trees, and how its presence escaped the attention of botanists for more than a hundred years is difficult to explain.

It was interesting to find that even here, where the plant is common, its tendency to spread out from a center is exhibited. In one of the patches, one hundred and fifty feet in diameter, the berries on every shoot were unusual in being white with pink cheeks like miniature peaches. It must have started to grow one hundred and fifty years ago; on one side it is separated from a patch bearing blue berries by a gap of only twenty-five feet, so that in a few more years the two will become mingled. Elsewhere in the vicinity other white-berried patches are already admixed with the blue-berried ones.

When the settlers first entered this region, they named a blueberry, which ripened its fruit in June, "june-berry," but, as often occurs in the mountains, this soon became corrupted and changed to "juniper." The name in time spread to the box huckleberry also, even though its fruit does not ripen until August. In central Pennsylvania the plant is sometimes called "Jerusalem huckleberry," while in northern Tennessee, where it has recently been discovered by Prof. S. H. Essary, it is known as the "bear huckleberry."

These discoveries in West Virginia have at last solved the mystery as to the long lost original localities of the box huckleberry.

Antics of the Puss Moth

By Francis B. Atkinson

SOME insects have to say "booh!" in various languages, to save themselves as best they can from their enemies. Take the case of the caterpillars of the puss moth, for example. These queer little creatures are very common on the upper surface of aspen leaves and of willows and poplars. They wear a green vest, a white bordered brown mantle and a three-cornered red hat something like Napoleon Bonaparte's.

Several of them will be browsing away as contented as a herd of cattle in a pasture, when all of a sudden they arch the forepart of their bodies, like a pussy cat arching her back, and begin threshing their tails about, as a cat does when it's angry. But the puss moth caterpillars have a way of their own. They curl the back part of their bodies up toward the head, run out a couple of little lashes from a pair of horn-like tails, and whip these lashes around their heads. They make you think of a cow trying to switch away a stinging fly in summer time.

COURTESY U. S. DEPT. OF AGRICULTURE

Puss moth, caterpillar and the fly that lays its eggs on the caterpillar, so the young when they hatch can live on it.

And that's exactly what it's doing—this pussy cat caterpillar. It's switching at a kind of fly that is trying its very best to lay an egg under the skin of the pussy caterpillar just back of the head, so that the larva that hatches from the egg can have the pussy cat to live on. To defend itself the puss moth caterpillar not only does this but it spouts an acid out of its mouth and thrashes its head back and forth. This movement of the head makes it harder for the fly to land. This swaying movement also increases the range of the acid, just as the wig-wagging of the garden hose scatters the water about when we wish to cover the entire garden, instead of throwing it all in one place.

Town Forests as Game and Bird Sanctuaries

By HARRIS A. REYNOLDS

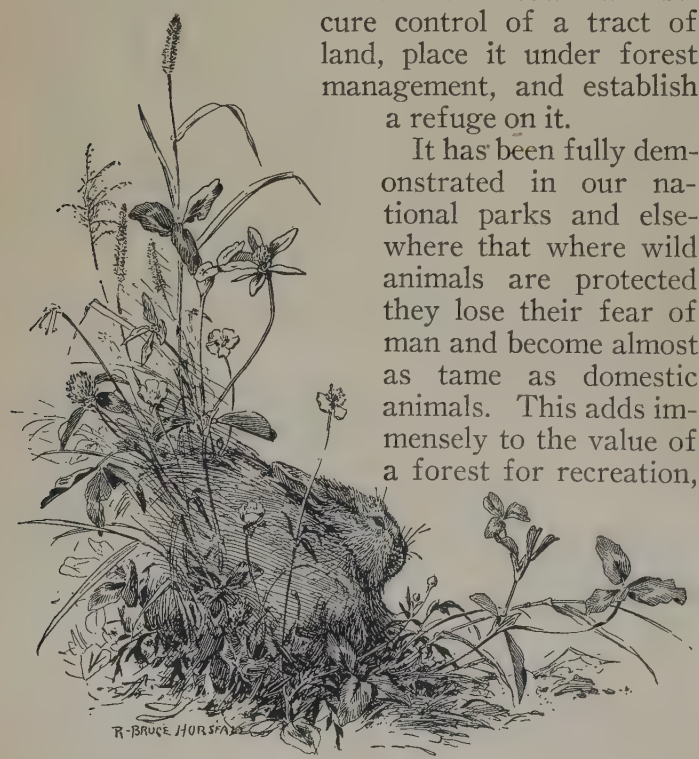
WE WERE walking through a beautiful plantation of waist-high silver firs and noticed on the tip of the leader of each tree a little bunch of flax. It was in the communal forest of Baden-Baden, Germany, and the chief forester explained that the flax was used to protect the young trees from deer browsing on the tender shoots. We were surprised that deer should be found in troublesome numbers so near the city, and said so. The area, the forester said, was a bird and game sanctuary. Sometimes, he added, the deer became too plentiful for the natural food supply and hunting was permitted for a limited period by the payment of a special license fee, increasing materially the income from the forest. The sanctuary not only replenished the game supply of the surrounding country, but the surplus became a profitable by-product of the forest itself, as well as furnishing meat for scores of families.

In the United States more than seven million sportsmen take to the woods for a few days each year. Our only hope of preventing the extinction of game birds and animals is the creation of sanctuaries where these wild creatures may breed in peace and safety—where they may find shelter during the hunting season. It has been said that our great-grandfathers hunted the buffalo and the antelope, our grandfathers the caribou and the elk, our fathers the moose and the bear, while we must be content to follow the deer. At the rate we are going our boys will have to confine their hunting exploits to rabbits. As with the forests, our prodigality and lack of foresight in the use of game have led us into straits where succeeding generations are deprived of the pleasures of hunting enjoyed by those who came before. Because of our wastefulness and stupidity, those who come after us must pay the bill for restoring these resources. In some instances this is

already impossible, so far has the waste gone.

In this dark picture there are, however, a few redeeming splashes of color which hold out hope for the restoration of game. The great Commonwealth of Pennsylvania is blazing a course that other states might follow with profit. In 1905 its legislature authorized the establishment of game refuges within state forests. Various amendments have been made to that act, one of which limits the area of the refuge to not more than one-half of the state forest on which it is located, insuring ample space for public hunting. In some sections of the state large game had become extinct, but by restocking and establishing these refuge areas hundreds of deer and many bears are now found each year in those same localities. Game is on the increase in Pennsylvania although in the past fifteen years the number of hunters has increased over fivefold. To larger refuges, averaging about 2,700 acres each, are being added smaller areas, known as auxiliary refuges. Some of these auxiliary refuges are as small as 250 acres but shelter large game during the hunting season, and many small game, birds and animals.

Pennsylvania has proved that game refuges are practicable. The success of this work has gone beyond all expectations. The auxiliary refuge permits almost any town to have its own game refuge by the establishment of a forest, even though small in area. Nor will it be many years before every eastern state will be *forced* to establish game refuges if it is to have game in its forests. Such protected areas in any state can be increased by thousands of acres if each town will secure control of a tract of land, place it under forest management, and establish a refuge on it.



It has been fully demonstrated in our national parks and elsewhere that where wild animals are protected they lose their fear of man and become almost as tame as domestic animals. This adds immensely to the value of a forest for recreation, especially to boys and girls, whose interest in animals never lags. Lands of small value now may, with a small expenditure, be made valuable wild forest parks in the course of a few years.

Game protection, however, is only half of the story. Our feathered allies the birds are of greater economic importance than the game. Were it not for their assistance, how would we suppress the insects. Even now the ravages of insect pests cost the farmers, orchardists and timber owners over $1,000,000 a day in this country, increasing the cost of food and clothing for all of us. Still, it is only in the past few years that we have begun to consider the problem of bird protection seriously. The migratory bird law and the treaty with Canada for the protection of birds are the greatest steps we have yet taken. States, towns and individuals are creating bird sanctuaries in many parts of the country, and the beneficial results are already becoming apparent.

At Birdacres, Sharon, Mass., there is a small sanctuary. This is a tract of only two and a half acres, the estate of Mrs. Harriet U. Goode, former chairman of the Conservation Committee of the Massachusetts State Federation of Women's Clubs. For fifteen years Mrs. Goode has been engaged in the study of birds and how to attract them. The land is on a side hill near a small pond, and fruit-bearing shrubs have been planted to furnish a natural food supply. Winter feeding has been carried on successfully, and when snow is on the ground from fifty to one hundred birds may be seen feeding at almost any hour of the day. Seventy species of birds have been observed on the tract and thirty-four species have nested there. Although this section is troubled with the terrible gypsy moth and many native insects, little spraying is necessary on this sanctuary.

These are examples of successful work with game refuges and bird sanctuaries. They have proved their worth. If such results as Mrs. Goode has obtained can be secured on two and a half acres, how much more can be done on the larger scale of a town forest. Such sanctuaries give pleasure to children. They hold educational value for old and young. It would be well worth the cost to any community to create forests for this purpose alone.

The forest is the natural habitat of game and of many species of song birds. By reforestation for timber production the principal requirements for both refuge and sanctuary are served. However, small areas distributed over the forest, totaling, perhaps, only a few acres, should be set apart especially to grow shrubs and trees that produce food for the birds. European forests have such areas near to the administration buildings or on sites favorable to such growth. This interferes but slightly with the

production of timber, for such plantations can be made on the borders of the forest or line roads and trails. They lend interest and beauty to the landscape without the formality of the city park.

Among these plants valuable both for landscape effect and for attracting birds are shadbush and several varieties of the cornels and viburnums. To give protections to the small birds from their enemies, hedges or clumps of dense-growing bushes should be planted, such as buckthorn, barberry, privet, cedars and junipers. Nesting boxes should also be provided and arrangements made for winter feeding. The cost of this work would be slight, especially where the town forest was large enough to justify the expense of a caretaker or forest warden. In fact, much, if not all, of the labor in connection with the bird sanctuaries could and should be done by the school children. The making and placing of nesting boxes and the planting of trees and shrubs would be splendid recreation for the older children, and a means of arousing public interest in the subject.

Hundreds of fish and game clubs are in existence. Bird clubs are rapidly increasing throughout the country. The thousands of members of these clubs could adopt no better project than the establishment of town forests. In no way can they advance their own interests so rapidly as to secure the now idle lands in the community that are fitted only for timber growing and establish town forests on them. A game club interested only in killing is more of a detriment to a community than a benefit. Unless such organizations make some effort to perpetuate the supply of game, their existence will be of short duration.

Then, too, a bird club without a sanctuary for a laboratory is seriously handicapped. Many of these clubs have private areas for this purpose. But why should not the public have a hand in this work both for enjoyment and education? There need be no serious conflict in the aims of these two types of organizations. By combining their forces with the forest lovers in many communities, they can have their own forest and their own bird and game sanctuary. The town forest movement is a means of bringing together the nature lovers of any community for the mutual advancement of their varied interests.

The membership of the American Nature Association now numbers about 100,000. The Association has reached a position of outstanding importance in the Nature and conservation fields and the members have reason to be proud of it. In the back of the magazine members will find a nomination form. We desire them to use this to bring in new members and make 1925 a banner year, carrying our membership to double its present number. Will each member kindly nominate one or more friends?

The Best of the Camp

By EDWARD F. BIGELOW

IN THE rapid growth of the modern development of camps many misunderstandings have arisen, and, curious as it may seem, the most conspicuous advantages have eclipsed what is really the heart of the thing.

Modern camping for young people has developed chiefly from military camping and the hunting, fishing and trapping of the woodsman. Military discipline, emphasized in many camps, has its advantages. Even the costume has a psychological influence. Of course a successful camp must have comfortable beds and plenty of good food well cooked as well as all the outdoor sports, both land and water, with plenty of organized play.

Horseback riding is good; boating is good; long hikes and excursions are good. These, of course, are emphasized by camp managers, but what is the very essence of camping? I am convinced that many parents fail to see this and refrain from sending their children to camp because they look at only the utility aspects, stating that they have just as good food at home as at camp and the child can just as well run, roam and play there. Perhaps they give the number of acres over which this playing may be done, pointing to the seashore or lakeside home with its facilities for boating and swimming every day. Some argue that a governess can give fully as good oversight and guidance as any councilor in camp, while others mistakenly consider home comforts vastly superior to anything that a camp can give.

THE SPICE OF INDEPENDENCE

At camp it flavors the blackened bacon and the roasted bread.

It is well to consider physical environment and all utilitarian phases, but, after all, let us be frank. Grown-ups do not meet in clubs, societies, dinner parties and the like because of the comforts of the meeting place and the comparative values and deliciousness of the food. They seek the social comradery of their peers, and that is the real gist of the camp with the added factor of the freedom that naturally comes in the great outdoors.

A home or even the best of boarding schools cannot supply all. Aside from the comradery there is in camp full scope for taking the initiative, for doing things without being told, for the joy of making discoveries and of telling of achievements to others. Do not do everything for children nor expect anybody else to do it for them.

In freedom of individual action the camp can best develop the activities and add most to the joys of the boy or the girl when there is the least of meddling on the part of older ones. To the average boy or girl no banquet at the Ritz could be so delicious as a roll and a bit of bacon toasted—usually scorched black, to be exact—on the end of a stick over an open fire in the woods. Why? Because the food actually tastes better? No, indeed. That delicious flavor is the spice of independence. The child had the fun of doing it from helping to gather the sticks for the fire, undoing the greasy package of bacon and spearing it with a stick on which it is burnt until it is "just right."

Camp managers have learned that the more they leave the young folks to themselves in doing things, letting them work out their own plans, the better. Of course one readily recognizes that this point can be carried too far and thereby become neglect, but I doubt if any well-managed camp is in danger of going so far.

The camp can do better for your child than you can yourself. Most of us like to think we are the most important persons in the world, and that statement jars upon parents accustomed to think of themselves as all in all to their children. Even they, however, recognize their own limitations in employing a doctor, a music teacher or other instructor. Many parents feel that they cannot bear to be separated from their children or to give them into the care of others.

You can care for your child when life is uneventful and usual, but when something new and important appears then a special set of trained workers is needed to manage that particular thing. Where is the father or the mother who would presume to remove adenoids or to vaccinate? Yet when it

comes to the question of general physical training or development, because camps and camping for young folks are such new things and so novel propositions, they fail to recognize the same principle, and considerable thinking is necessary before reaching the correct conclusion.

Fathers and mothers who really love their children, yet correctly understand modern camping, do not accompany their children to camp. Many are deterred from giving their children the benefits and privilege of camp because they feel that they cannot afford the time nor the expense of taking them there. Camping is so well organized today, however, that almost every high-class camp has agents and councilors in the leading cities. Place the boy or the girl in the hands of one of these councilors, saying goodbye at home or at the local railroad station. The child wants the fun of traveling without father or mother as much as he wants the joy of doing things in camp.

Wait until the camp has been in full swing for some two or three weeks before you visit it, and then rejoice in the enthusiasm with which your son or your daughter from a fund of superior knowledge imparts to you, poor, ignorant noncamper, full information as to the various activities. That child will chuckle quietly to himself when you—blessings on your innocent head!—ask the simplest of questions. "Why, father doesn't even know about the terms of honor, and mother does not know about inspection nor the things necessary to get high marks." If you are wise, you will assume an added density of ignorance! Do you not know that every one finds joy in seeing and telling of some new thing? Just be the biggest dummy on earth and enjoy, as father looks at mother from the corner of his eye, that look of utter superiority that comes into the eyes of son or daughter, plainly saying, "Did anyone else ever have such ignoramuses for parents as I? They do not know the simplest things about this camp!"

It is thought that gives joy. Mind is superior to matter. It is therefore not the gun, the rod, the frying pan or the hemlock bed that caused the modern camp to spring into its great popularity. Writers, not fishermen, have made fishing popular. Magazines and books dealing with rod and gun have brought the present-day enthusiasm. When we look for the gist of that we are seeking something more enduring as well as more inspiring than material things.

A STEAK OVER THE COALS

The main factors in camp are not the boats, horses or the dining-room.

BASKETRY FOR DIVERSION

One of the interesting arts learned by many at camp.

The main factors of a camp are not the boats, the horses or the dining-room. They are the assemblages of the young people for camp songs, camp poems, descriptions of outings and the like. Perhaps the most fun is in the little groups in the various bungalows or tents, the hobnobbing in the shade of the wide-spreading apple tree, the songs at sunset in canoes side by side on the lake.

This thought leads us to the nucleus that solitude is enjoyable if in that solitude one has congenial companions to whom he can tell the joys thereof. It is therefore extremely important that the child

be placed in the camp to which it is personally adapted. We who are naturalists can go into ecstasies over birds and their songs, over babbling brooks and beautiful flowers, but we know that, from the point of view of diplomacy, these never render full benefits unless enjoyed with agreeable companions. Humanity will persist, as did the working woman who returned before the assigned time when her expenses of a vacation in the country were paid by a charitably disposed person, that it likes people better than stumps.

That is, at the same time, only a half truth. Most of us have a craving for primitive nature, but we like the stumps and the primitiveness in the company of congenial people. A chance unkind word by a councilor has sometimes colored the entire camp for the season, while hearty comradery obliterates any slight disadvantage.

But, after all, the joy of camping is not in what fellow-campers do for one but in what one does for the others. You, parent, may reprimand and instruct, but it is only when a child gets to camp and receives a new point of view of the necessity of adaptation to others that real joy and benefit are produced. There is no joy equal to making someone else happy, and it does not take two days of camp to teach every camper that. Of course, to a certain extent, this is taught in home and school, but never so completely and so effectively as at camp. There one must fit in and know how to make friends. With ninety-nine out of a hundred the lesson is soon put into practice.

That is the keynote of camping—to learn to get along with one's associates. Life is made up mostly of people, and the earlier one learns to like people and to make friends the easier will be life's pathway.

If a parent figures out the matter from the point of view of the food and the land and water sports, the conclusion may easily be erroneous. If he thinks about it from the advantage of his own personal care, again he is on the wrong track. Then, also, if the measure of his own loss of companionship is the basis for action in the decision not to send the child to camp, that is inexcusably selfish.

We older ones prize our children's companionship, their absence makes us lonely and forlorn, and we count the days to their return, but that is not the slightest reason why you and I should interpolate our own interests and deprive that son or that daughter of the benefits of going, staying, doing and coming.

Beauty in the Desert

TO MOST of us the word "desert" conveys an implication of anything but beauty. We are apt to think of sterile, sandy, stony waste, whose sparse vegetation repels the observer with its thorny stems and leathery, grayish leaves. The idea of flowers in the desert seems incongruous, even impossible.

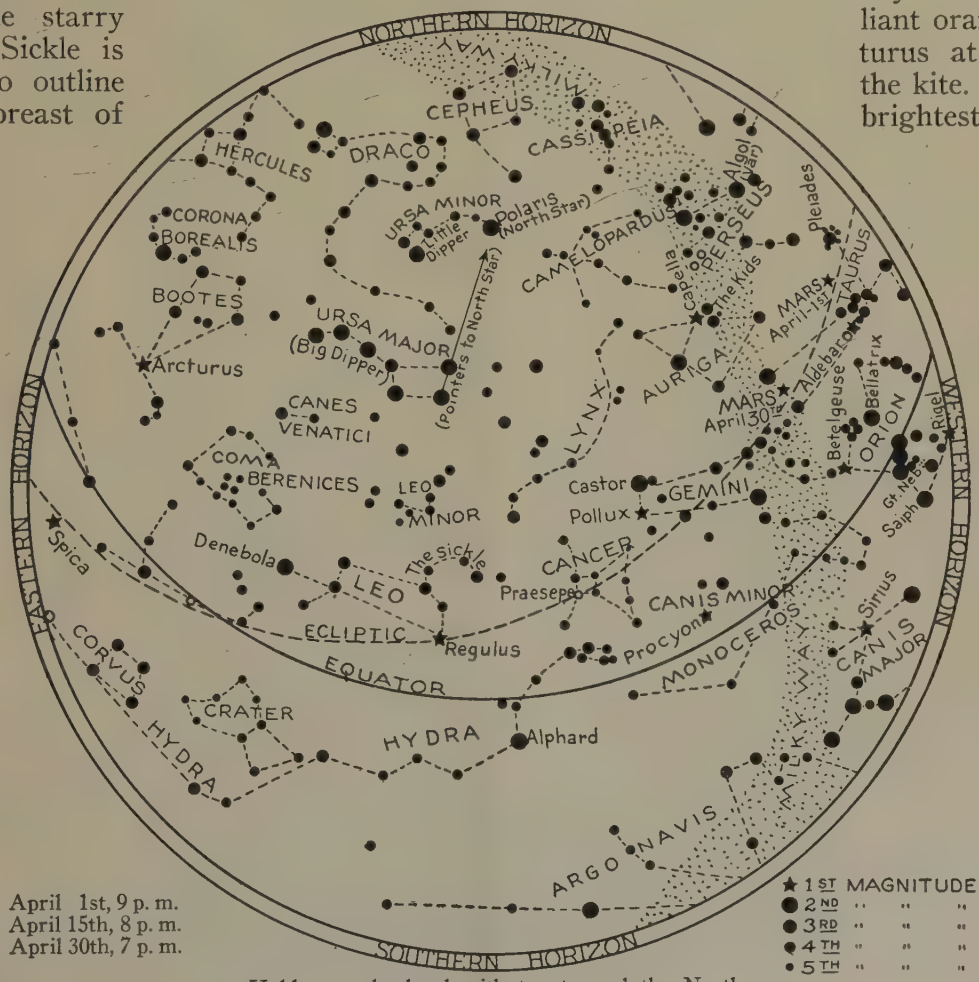
Yet in the arid and semi-arid regions of the American West there are many plants whose monotonously ugly lives are relieved, for a brief period each year, by a short season of beauty that rivals any dream of Persian gardens. After the spring rains and before the long drought of summer sets in, and again between the autumn rains and the oncoming of winter, one may find among the sagebrush or chaparral a host of low-growing plants, eagerly spending the brief life of their delicate, bright-tinted flowers.

One of the loveliest of these is shown here. It belongs to the Evening Primrose family, and is known variously as Rock Rose and Fragrant Primrose. During most of the year its rosette of tough, jagged-edged leaves, sprawling among the stones or on loose gravel-slides in the mountains, seems quite in keeping with its rough and forbidding home. But during the spring, and occasionally also after the fall rains, the plant unfolds its group of large, fragrant, white or rose-tinted flowers, and shines forth as a veritable Cinderella of the desert.

The Evening Skies in April

By ISABEL M. LEWIS

WHEN the first flowers of early spring appear among the brown leaves in the woods and the trees are tinged with green, then look for The Sickle in Leo, due south in the evening. You cannot mistake this group of stars, for it really does resemble the object for which it is named, which is more than can be said for some of the many strange objects the ancients loved to trace in the starry heavens. The Sickle is also supposed to outline the head and breast of Leo, and Regulus, the bright white star in the handle of The Sickle, was also known as Cor Leonis, Heart of the Lion, a name that is not heard so often now as in the past. Regulus is known to the astronomers also as Alpha Leonis, Alpha in the constellation Leo, which means it is the brightest star in Leo. Denebola, the star that marks the tip of Leo's tail and which you will easily find some distance to the east of Regulus, is the second brightest star in Leo and is called Beta Leonis.



April 1st, 9 p. m.
April 15th, 8 p. m.
April 30th, 7 p. m.

Hold over the head with top toward the North

Denebola in Leo, Arcturus in Boötes, some distance to the northeast, a brilliant orange star that you cannot fail to find, and Spica in Virgo, a beautiful white star tinged with blue that is now well over in the southeast, mark the three corners of a huge triangle with sides of equal length, Another huge triangle similar to this, you will remember, is still visible far over in the western sky, its corners marked by Sirius, Betelgeuse and Procyon. First locate these two triangles on the chart and then see if you cannot readily find them in the sky, the one far over in the east, the other approaching the western horizon.

The stars that outline the constellation of Boötes, The Herdsman, also form a very good boy's kite, with the brilliant orange colored Arcturus at the bottom of the kite. Arcturus is the brightest star now visible in the eastern half of the sky, so one should have no trouble in finding it and then in tracing out the constellation in which it appears.

Directly west of Boötes is the familiar Big Dipper which is now swinging high into the heavens above the pole, while Cassiopeia with its well-known W, so conspicuous all winter, drops slowly downward to a position below the pole close to the northern horizon.

The Pointers of the Big Dipper now lie very close to the meridian nearly due north of The Sickle in Leo with the insignificant little group known as Leo Minor, The Lesser Lion, between Leo and the bowl of the Big Dipper. Another small group with a big name, Canes Venatici, The Hunting Dogs, will be found a little below the handle of the Big Dipper. The brighter of the two principal stars in this constellation was called Cor Caroli, Heart of Charles, by the astronomer Halley in honor of

Charles the Second of England, the court physician at that time insisting that this star shone more brightly than usual the night before the return of Charles to London!

South of the Hunting Dogs is a coarse cluster of faint stars, appearing to the naked eye much like a filmy veil of light, that is known as Coma Berenices or Berenice's Hair. This is an interesting region to study with a field glass or opera glasses, as is also the cluster of stars in Cancer to the west of the Sickle in Leo that is known as Praesepe or The Bee-hive.

In the southern heavens this month we find the huge constellation of Hydra, The Water-snake, with its riders, as they are called, the two small groups of Crater, The Cup, and Corvus, The Crow. One cannot miss this long, straggling constellation, for it stretches from a point west of the meridian below Cancer where a group of stars mark the creature's head, to the southeastern horizon below Spica in Virgo, occupying the greater part of the southern sky. Its brightest star is now a little west of due south and is a star of the second magnitude known as Alphard.

Hydra does not end at the southeastern horizon but will be seen next month to extend for some distance below the constellation Virgo to a point where a few faint stars mark the tip of the tail of Hydra. This constellation reminds us, in a way, of the River Eridanus, which has now passed from view below the western horizon, in that it consists of a long line of rather faint stars in the southern heavens and extends for an enormous distance. Eridanus, however, has one star of first magnitude, Achernar, in the southern hemisphere, while Alphard, the brightest star in Hydra, is only of the second magnitude.

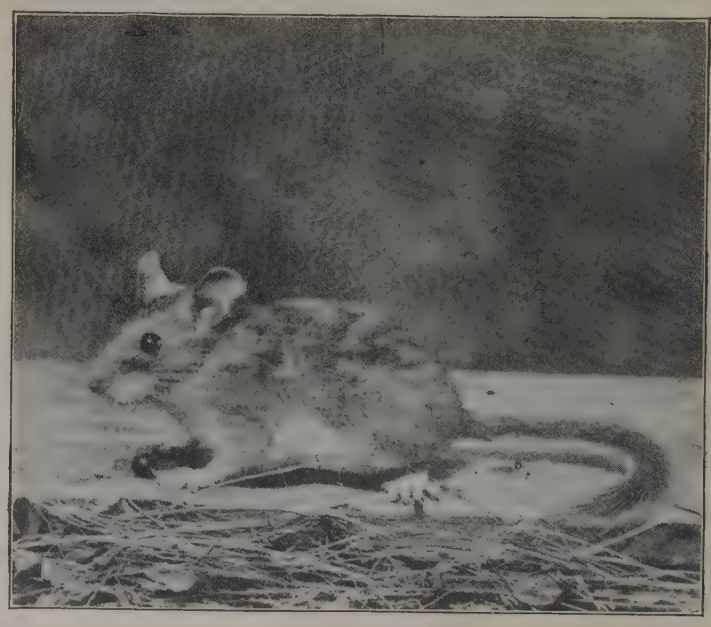
Before long we must bid farewell to some of our friends of the past six months, The Hyades and Pleiades in Taurus, and the magnificent Orion. They are now drawing close to the sun, and we will not see them again in the evening hours after a few weeks have passed until next fall. The western sky is still filled with the brilliant jewels of the winter months, however. The stars of Orion and Taurus will soon disappear, but Procyon, Castor and Pollux in Gemini and Capella will remain in the west for a much longer period. The planet Mars also lingers yet in the western sky, ruddy and brilliant still, but decreasing in brightness as it continues to recede from the earth. Mars is now north of west in the constellation of Taurus and during the month will move from a point southeast of the Pleiades to a point about midway between the tips of the horns of Taurus.

On the twenty-fourth of this month Venus comes into conjunction with the sun, when it will pass from the eastern to the western sky. It will be too close to the sun to be seen this month or next but will be seen in June in the western sky after sunset.

Saturn is now between Virgo and Libra and very shortly will appear in the southeast some distance to the southeast of Spica. By the middle of April Jupiter will be rising before midnight, but it will not be visible in the early evening hours for some time to come.

Tricks of "Trade" Rat

ONE OF the oddest little animals in existence is the California wood rat, better known as the "trade" rat. It gets its last name from the fact that, though it is a great thief, it never steals anything without putting something else in its place. The story is told of a paste pot which had been left-over in the assay office of the Silver Queen Mine and which was found in the morning filled with the oddest collection of rubbish. At one time when a trade rat's nest was found in an unoccupied house, the outside of the nest was composed entirely of iron spikes laid in perfect order, with the points outward. Interlaced with the spikes were about two dozen forks and spoons and three large butcher knives. There were also a large carving fork, knife and steel, several plugs of tobacco, an old purse, a quantity of small carpenter tools, including several augers, and a watch, of which the outside casing, the glass, and the works, were all distributed separately, so as to make the best showing possible. None of these things was of any earthly use to the rats. They must have collected them for the same reason that a child hoards up odds and ends with which to play, saving them with no regard for usefulness.



Save the Dogwood

SOON cream-white and pink-tinged blooms will crown the branchlets of the dogwood bush. Soon, too, thousands will drive and wander through the parks, wild and cultivated, and out into more open country where tree, shrub and flower have sprung into new life. If the dogwood bush could tremble with fear it would do so, for the annual assault will be on.

It is the battle of the springtime between the wild bush, struggling for growing beauty, and the citizen stripping branches of this beauty only to have the flowers quickly fade and to throw the bedraggled remains by the roadside.

"Please leave the dogwood for others to enjoy," was the plea broadcast throughout the District of Columbia last year by press and by poster. Street cars carried legends urging the saving of the dogwoods. Merchants, florists, theater owners, Boy Scouts and Girl Scouts and schools cooperated in seeing that posters were well displayed. Newspapers gave over display pages to urging that this flowering shrub be left in its spring beauty.

Sentiment was so aroused in the nation's capital that the campaign can be safely termed a success. Visitors to Washington during its period were impressed by its extent and took away suggestions with them for use at home to arouse their own neighbors in defense of the beautiful dogwood.

CREAM-WHITE, PINK-TINGED BLOOMS

Painting of Western dogwood which differs from Eastern species.

The dogwood is of alluring spring beauty. That it attracts the passerby, whether on foot or in automobile, is not to be wondered at. That it should entice them to strip off the branches of large soft flowers is easily understood. But how much more beautiful is the dogwood left growing! It is not uncommon in sections where this bush is plentiful to see on a late Sunday afternoon many dejected branches, with their blossoms limp and faded, gathered only a short while before by passing motorists and then thrown aside, the beauty Nature gave them gone.

Dogwood is not alone among those wild flowers found growing within easy reach of the casual and often thoughtless pleasure-rider and subjected to foolish and unnecessary gathering. It is, however, one of those that fades most quickly; whose natural beauty prospers only when it is drawing its strength from the earth which gives the beauty to the bush.

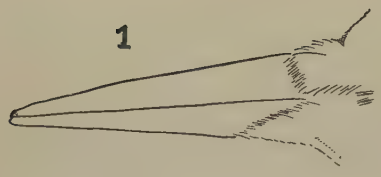
Campaigns to save the dogwood can be easily organized in any locality. Those same groups that cooperated to make it a success in Washington will cooperate everywhere. It is to be hoped that such efforts will be made throughout the nation. All that is needed is to teach the lesson that to enjoy the dogwood it must be left for others to enjoy.

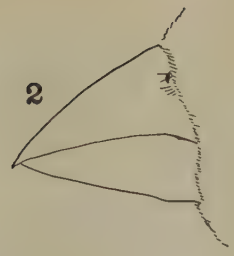
Practical Nature Puzzles

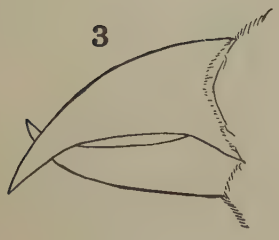
By E. LAURENCE PALMER

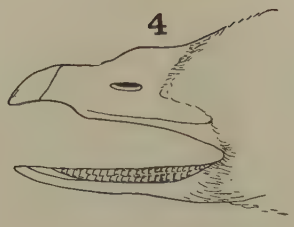
THERE are probably as many significant structural differences in birds as there are in mammals. Last month these pages gave you puzzles dealing with mammals. This month I am giving you some puzzles in bird study. In solving these puzzles you may form some generalizations which should be useful to you in interpreting the possible activities of a bird which you might find whose name you might not know. Try it anyway!

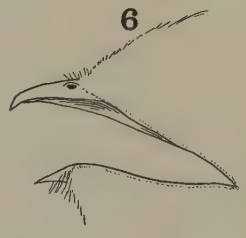
Numbers 1 to 10 deal with the bills of birds.

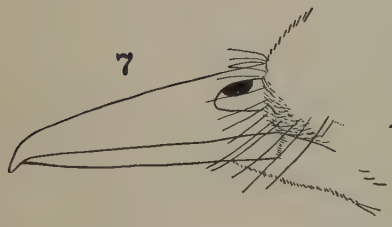


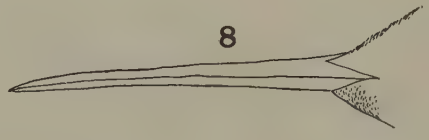


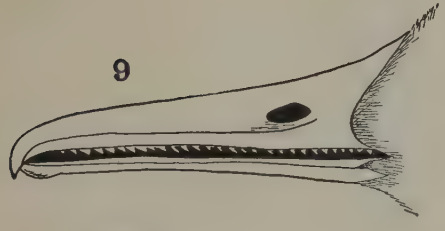












Which of the bills belongs to the hummingbird that reaches deep into the throat of flowers? (6)

Which of the bills belongs to a night-hawk which captures insects on the wing while in full flight? (4)

Which of the bills belongs to a merganser or shelldrake which catches fish? (9)

Which of the bills belongs to a sparrow which eats hard seeds? (7)

Which of the bills belongs to a phoebe which captures insects? ( )

Which of the bills belongs to a heron that feeds upon frogs? ( )

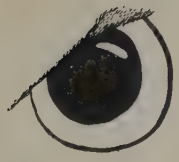
Which of the bills belongs to a woodpecker that digs holes in wood? ( )

Which of the bills belongs to a duck that gets its food under water and strains out the water? ( )

Which of the bills belongs to a hawk that tears its prey of mice? ( )

Which of the bills belongs to a crossbill that extracts seeds from the cones of evergreens? ( )

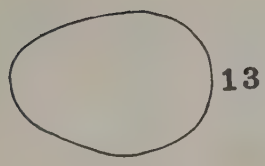
11 and 12 show the left eyes of two equal-sized birds. They are so placed that the space from the edge of the cut to the middle of the cut represents the distance from the middle of the bill to the outer profile of the head.

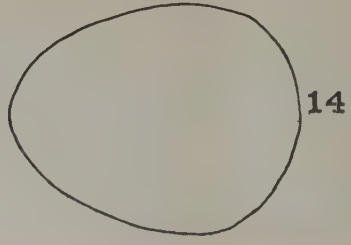


Which of the eyes belongs to an owl that feeds at night? ( )

Which of the eyes belongs to a hawk that feeds by day? ( )

Killdeer plovers and robins are birds of approximately equal size. Their eggs are shown as 13 and 14.



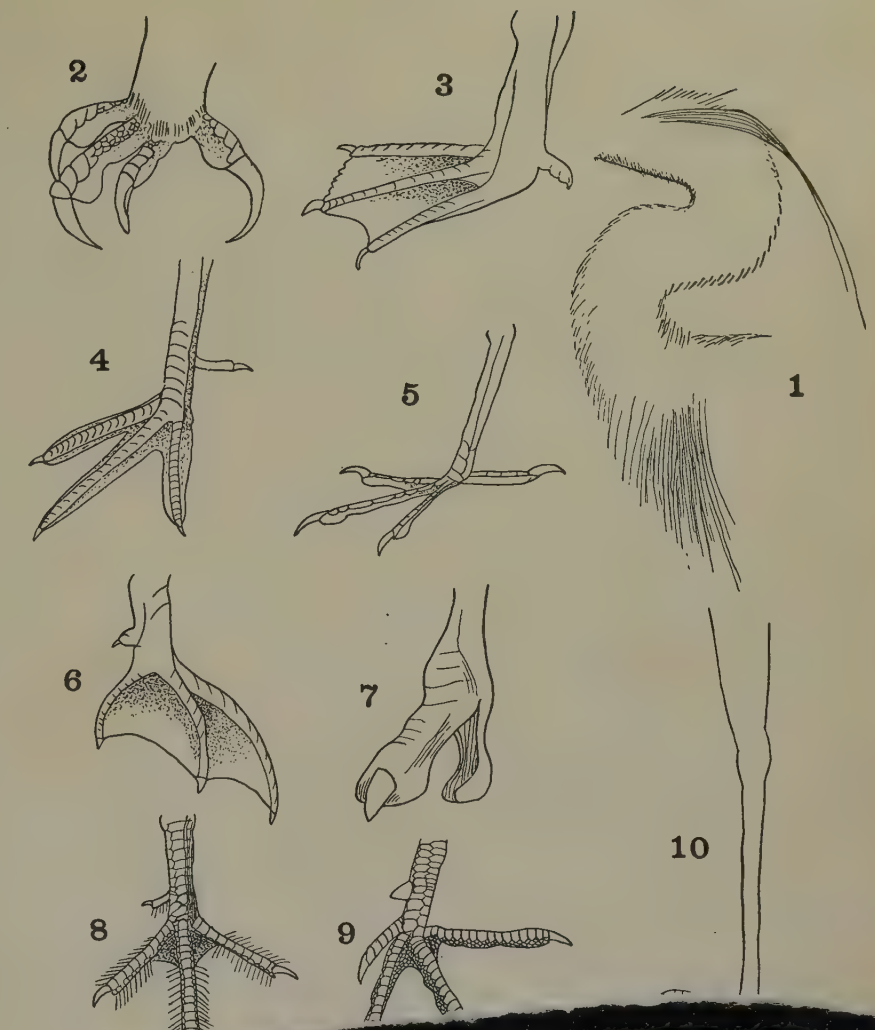


Which of the eggs belongs to the plover whose young can run and feed themselves shortly after hatching? ( )

Which belongs to the robin whose young are helpless when hatched? ( )

Answers to March Puzzle

The answers to the puzzles last month are as follows: Cougar 9; horse 1; wolf 10; man 8; ant-eater 7; chipmunk 2; 11 eats plants; 4-year horse 3; 5-year horse 5; 6-year horse 6; older horse 4. Second page answers follow: Red squirrel 2; flying squirrel 3; lamb 4; yearling sheep 7; 2-year sheep 5; 3-year sheep 1; 4-year sheep 6; squirrel 10; beaver 12; horse 8; deermouse 11; meadow mouse 9; mole 14; bat 15; squirrel 20; sea lion 19; sloth 18; horse 16; cow 17; cat 13.



To which set of bird's legs shown on this page would you imagine the neck shown as number 1 would belong? ( )

Which of the feet shown belongs to a loon which is an excellent swimmer but can walk upon land only with great difficulty? ( )

Which of the feet belongs to a duck that can swim well, but can walk upon land with fair success? ( )

Which of the feet belongs to a phalarope which, unlike many of its kin, prefers to paddle the edge of waterways in soft mud? ( )

Which of the feet belongs to a grouse that can walk safely on soft snows? ( )

Which of the feet belongs to a pheasant that scratches for a living? ( )

Which of the feet belongs to a great blue heron that wades in deep waters? ( )

Which of the feet belongs to an ostrich which is a most excellent runner? ( )

Which of the feet belongs to an eagle that holds its prey in its talons? ( )

Which of the feet belongs to a blackbird which perches well, but does not hold its prey in its claws? ( )

The four sets of wings are shown in proportionate size. The space between the wings represents the width of the body.

Which of the wings belongs to a hawk that soars with great ease? ( )

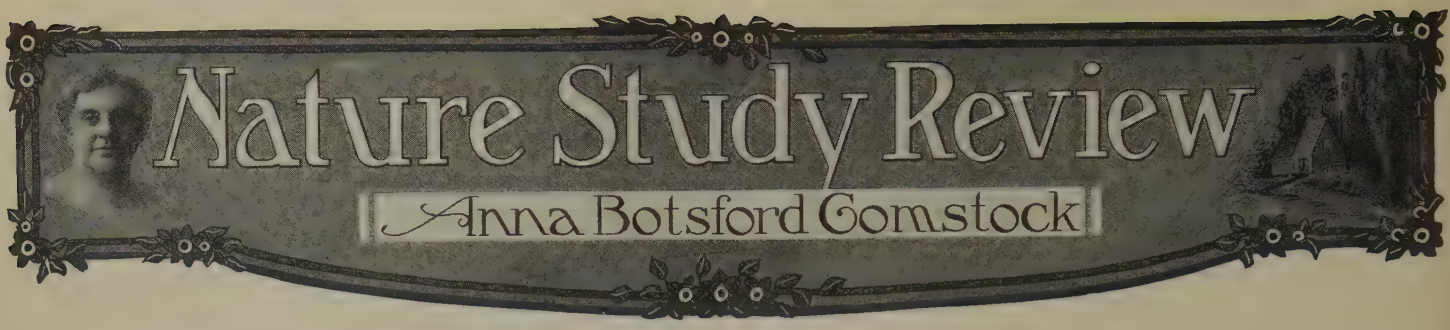
Which of the wings belongs to a swallow which is an excellent flier, and can dodge and dive after insects in the air successfully? ( )

Which of the wings belongs to a penguin which cannot fly? ( )

Which of the wings belongs to a grouse which flies with rapidly beating wings over comparatively short distances? ( )

Which of the tails shown belongs to a chimney swift which can perch on a chimney? ( )

Which of the tails shown belongs to a hawk which sails? ( )



"Go to the Ant"

WE WERE exploring the Savannah boulevard that leads from Panama City of Old Panama. The latter had once been a flourishing and fabulously rich city but was destroyed by the English buccaneer, Sir Henry Morgan, in 1671. He had evidently done his work thoroughly, for all that remained was a decaying stone arch across the stream, once a bridge that marked the entrance to the ancient city, and some crumbling ruins of a large convent and a beautiful broken tower of the cathedral upon whose falling walls vines and shrubs clung lovingly as if to heal the scars of war and devastation.

We entered this ruin to see what we might of its architecture, when our eyes were attracted to the exploring root of a tree which had stretched up on a solid corner of wall of the old

parently a legume; some showed circular cuts which gave the green banners a broken outline.

However irregular their banners, there was no irregularity in the ant squad marching in single file, not too close together to cause confusion, their green banners flickering in the sunlight as they moved rapidly down the root. Closer observation showed a single file of ants hastening in the opposite direction, unburdened with leaves, hastening to the chosen tree to get banners to carry home.

Suddenly our attention was attracted to a banner-carrying procession on the ground at our very feet; not only on the ground, but following a straight road which was a triumph of formica construction. It consisted of a shallow trench half an inch deep and three or four inches wide; it was laid out very straight and led away into a field

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larger leaves were cut and watch the process of cutting. It is said that some species of these ants work in relays, one relay climbing the tree and cutting off the leaves and the other gathering them up and carrying them home; but this was not the way of these ants, we felt sure.

We then turned our attention to the goal of all this effort and found it at the focus of several of these busy highways. The nest was beneath the roots of a tree growing in the midst of the ruin; it was beneath the surface of the ground, and its various openings covered a space of six feet square. The openings were large and oblong, some of them fully an inch wide and a quarter of an inch high. The neat way in which the ants turned their stiff banners to get them through these cellar doors won our admiration. Sometimes one would "get stuck," at which she would back in and twist her leaf this way and that until she could pull it in successfully after her.

What did these ants want of these bits of leaves after they had stored them in their dark cellars? This is a story that Dr. W. M. Wheeler has written most interestingly. These leaves stored in the cellars are used as a culture medium for growing a fungus, which is the food upon which these ants live. Thus our ants belong to the company of mushroom growers and know how to raise their crop by planting the spores on the decaying leaves. "What acres of mushrooms this colony must grow?" was our thought as we tore ourselves away reluctantly, for still the ants were coming, carrying their leaves, steadily marching along their various high-

ways, thousands of them, and still were others hastening forth to the harvest. This was the accepted time of year for gathering the leaves, for the rainy season was just ending and the leaves were fresh and lush.

We were impertinent enough to capture a few standard bearers in order to examine them at our leisure. We were entirely unprepared for what the lens revealed. Our ants were, everyone, armored Amazons. The thorax bore three pairs of fierce spines, the middle one shorter than the others; the large head carried a pair also and was armed with a mighty pair of jaws. After looking at these great shears-like jaws we could understand how they could cut leaves and carry them in an unyielding grip. When we picked one of the leaf banners the ant carrying it refused to let go her hold and thus we captured her; looked at in the face, she had the expression of a Mephistopheles. We could understand the rapidity of the procession when we reviewed the long legs of our captives.

As we drove back to our ship along the tropical highway, our minds were so full of wonder over the performance of these ants that we gave only a passing glance at a Spanish woman carrying a shot gun, "hunting Iguanas which are as good as chickens to eat," explained our guide. Nor when we saw one of these huge lizards dash across the road like a crested, long-tailed rocket, did we for more than a moment forget the long processions of green banner-bearers on the ant highways.

Nature Study Supervisors Meet

Extensive consideration of the task of preparing teachers for Nature study work largely occupied the time of the sixth annual meeting of the National Council Supervisors of Nature Study and Gardening held recently in Cincinnati in connection with the meeting of the Department of Superintendence of the National Education Association.

Professor Lester S. Ivins, of Kent College, Ohio, emphasized the value of taking economic phases of Nature as a basis for scientific knowledge and study of natural life. Declaring that natural science is second to none in importance, Miss Mabel Turner of the Botanic Gardens, Brooklyn, New York, asserted that the real problem is teacher training. This thought was carried forward by Jesse L. Smith, of Highland Park, Illinois, with the suggestion that more use be made of current events in Nature. He asserted that Nature Study cannot be stereotyped but must have no beginning and no ending. It is a constant study, he said.

Professor J. A. Hollinger, Nature study supervisor of Pittsburgh, Pennsylvania, told the meeting that the Nature study curriculum is in court. It demands analysis and study in order that its scope may be definitely set out in the interest of progress. Professor Elliot R. Downing of the University of Chicago brilliantly discussed the aims and methods of Nature study, urging the application of social usefulness as a good measure of procedure.

The need of including study of conservation of forests and wild life in the Nature study curriculum was emphasized by Richard W. Westwood, assistant secretary of the American Nature Association; Dr. F. W. Felter, of Cincinnati, and Mrs. S. B. Waters, of Cincinnati. M. R. Van Cleve, Nature study supervisor of Toledo, Ohio, and president of the American Nature Study Society, discussed the present and future of Nature study. He pointed out that his society is now conducting a national survey of this work and gathering valuable information on it. Miss Alice Jean Patterson, of the State Normal School at Normal, Illinois, was reelected president.

Many copies of NATURE MAGAZINE *go each month to schools. Teachers are getting a greater use from them by allowing each child in the class to carry the magazine home over night for their parents to read. This is a practice that should most certainly be followed by teachers for it immeasurably broadens the reach of the Nature message.—Anna Botsford Comstock.*

For the Wildflower

Do not forget the word "preservation," counsels the editor of *Wild Flower,* the quarterly publication of the Cincinnati chapter of the Wild Flower Preservation Society of America. Dr. H. W. Felter, who edits this attractive publication, deplores a tendency to shorten this title to wild flower society. It is satisfying to know that, having attained its one-year mark, this quarterly will go forward with its fine work during 1925. Both the Cincinnati chapter and Dr. Felter are to be complimented on their achievement, and the little magazine is receiving the wide attention it deserves.

Butterfly Instinct

"Butterflies have a greater instinct than any other insect," writes M. L. Greenman, one of our youthful members, an American boy living in Stratford-on-Avon, England. He tells of an experience he had in trying to photograph a Hunter's Butterfly eating. A cut apple was set out to entice him, but before the kodak could be focused the fluttering fellow left. Mr. Greenman placed a specimen of a Mourning Cloak Butterfly on the apple so that he was apparently enjoying the meal; the Hunter came near but refused to light on the apple, seeming to realize that the other had ceased to fly and had become only a specimen. The Hunter refused again to approach the apple after the Mourning Cloak had been removed. Mr. Greenman points out that an ant will feed regardless of how many dead ants are covering the food.

Nature Study Course

The "Course of Study in Nature Study," written by M. R. VanCleve, an available from the Toledo, Ohio, Board of Education, sells for thirty cents, not twenty, as quoted in the Nature Hints Department of the February issue. It is said by Nature study teachers to be worth every cent of the price in aiding them in their work.

Hints to Nature Readers

By ELIZABETH K. PEEPLES
Instructor of Natural History, Washington, D. C.

This discussion of articles in the Magazine, together with hints to teachers and other readers on how to use them, is proving most helpful in Educational Work

"Scotty" No animal makes a better Nature lesson than the dog; nor is there one more easily made at home in the schoolroom. A Scottish terrier, if procurable, is a particularly interesting specimen for study because of the very qualities displayed by "Scotty," his freedom from fear, his unswerving devotion, his intelligence, and his peculiar appearance, easily accounted for on the ground of adaptation to his natural mode of life. The story of Roddy's heroism will appeal to everyone. Though the live dog be brought to school, do not fail to let the children enjoy the rare pictures which accompany this article.

* * *

The Grebe That Forgot to Fear One argument for teaching Nature Study is that through it children acquire a background which makes possible the appreciation of works of art, literature, and music inspired by and concerning Nature. A classic, whether it be a picture, poem, story, or song dealing with the subject under discussion infinitely enriches the Nature lesson. "The Grebe That Forgot to Fear" is a prose poem which should be read aloud in every class of Junior High School age studying that bird, and besides its distinct value as Nature literature, it is of high importance as the story of an interesting bird.

* * *

White-robed Shadbush The Shadbush, recommended for cultivation, not because of any danger of its extemination, but because of its beauty and the ease with which it is grown, is a delightful addition to the home or school garden. It may be grown from seed, or transplanted, and rare sorts may be grafted on roots of wild plants, the author tells us. Considerable detail is given as to the best varieties for garden planting. This shrub on the lawn or in the school grounds provides a charming subject for Nature Study, a profusion of spring flowers for indoor decoration, and a supply of food for the birds.

The American Beaver When teaching the beaver the instructor, whether parent or teacher, will gather from this article much of the atmosphere of the creature's habitat, and many facts such as the signs by which one may recognize the presence of beavers in a region, the appearance and purpose of the dam, the materials of which it is made and their arrangement, and the strength and ferocity of the beaver in his own defense. As the beaver is one of the fur-bearers which has been so trapped and persecuted as to have been driven to the most remote and secluded parts of the wilderness, the danger of its extermination and the need of better laws for its protection should be emphasized.

* * *

The Singing Insects of Japan The terrarium, easily made from an old berry crate with sides of glass and ends and top of wire netting, carpeted with earth, grass and moss, and daily supplied with fresh plants of the kinds especially enjoyed by the insect guests inhabiting it, has long been the accepted substitute where outdoor insect study is impossible. The account of "The Singing Insects of Japan" told or read to children would unquestionably awaken interest in making and stocking such a terrarium, and might be followed by the making of smaller insect cages by individuals in the class.

* * *

Coyote, the Prairie Wolf After studying the dog it is very natural to wish to know something of his wild relatives. One must keenly relish this story of the coyote, which they may read for themselves. From it one will learn what a coyote is and how it lives, the fear natural to this wild creature, how instinct holds sway even under artificial conditions, how an animal learns by experience, and how motherhood sharpens a creature's wits. One will moreover inevitably sympathize with the coyote in her effort to outwit the enemies who sought the life of her little one. The pictures are both attractive and valuable for study.

In the Wake of Glaciers If the pages of "Nature's free library" which be open at the door include those bearing glacial hieroglyphics, the story of the glacial age is best begun by translating them. Study the mantle of debris disclosed in some railroad cut, an example of gouged rock carved by the glacier's rasp, a cone, a kettle, a boulder, or a pot-hole. Having helped to interpret the glacial records nearest home or school, read "In the Wake of Glaciers" and study its illustrations after which be on the lookout for other ice scars in the neighborhood landscape. For children in localities where glacial history is not written in the rocks the article constitutes excellent supplemental reading in geography.

* * *

When the Waters Break Loose Those interested in geography, bent upon an investigation of floods, will find in this article a thorough yet simple exposition of the phenomena which, since the days of Noah, have created such havoc upon the earth. The reader should study the article and pictures preparatory to a discussion of the topic. Additional pictures and information gathered from other sources will increase the interest of the lesson.

* * *

Town Forests As Game and Bird Sanctuaries Here is an article whose every paragraph offers a practical suggestion in conservation. The establishment of town forests as sanctuaries, through the united efforts of the fish, game, and bird clubs, and other Nature enthusiasts of a community is a project which supplies students of wild life with a laboratory and sportsmen with a perpetual supply of game. The need of such measures is all too plainly shown by the decrease of many forms of wild life and the disappearance of others, as well as by the ever-increasing insect hordes against which the birds are our chief defense.

Have You Heard It?

For more than a century a bobolink song has been handed down in the family from mother to daughter, writes Miss A. M. Hartt, of Wolcott, N. Y. The song is written and goes like this:

"Chingly chongly goes litch-a-tick spindicals-ting-o-day-o-double o h-o-whiree whiree comes such a trichicle-klioh-klish-klioh."

Miss Hartt says that she has lost sight of the origin of the song, has never seen it in print and has never met another Nature lover who has heard it. No more have we. Have you?

Dooming the Dove

"Surely there is enough to eat in Ohio without starting on the doves," declares a member, commenting on a clipping announcing the introduction of a bill in the Ohio Legislature making an open season on doves from September 1 to 15. There is now a prohibition in the state against taking these birds, they being now on the songbird list. The bill provides a bag limit of twelve. It does seem that the turtle dove might be left unattacked.

Action in Illinois

Friends of Our Native Landscape is the name of the organization headed by Mr. Jens Jensen that has taken up the standard of conservation progress in Illinois and worked out an admirable park and forest policy for the state. In an attractively printed pamphlet this association presents a constructive park policy worked out by Mr. Jensen and a forward-looking forest policy prepared by Mr. F. W. VonOven, endorses these two programs and dedicates itself to an active legislative campaign in support of conservation. With all due respect to a great and sovereign state, Illinois needs these friends.

N. Y. Conservation Week

Observance of the birthday of John Burroughs will be one of the features of New York's Conservation Week—the first week in April—as carried out by the New York City Federation of Women's Clubs. The annual conservation essay contest in the New York schools, inaugurated by the conservation department of the federation under the leadership of Mrs. Charles Cyrus Marshall, will also mark the week. There will be various other activities carried on throughout the state to arouse even more interest in the great problem of conservation.

Bird Sanctuary Wins

After more than two years of work the Palma Ceia Civic Club of Tampa, Fla., has succeeded in having a coastal bird sanctuary set aside. Mrs. L. B. Grando writes that there are many birds and animals in the section and that in the winter the bay is frequently alive with ducks. She says that she has seen men come in with almost a boatload of ducks and the next morning several dead ones would be washed ashore. The movement of the club was opposed by those who wanted unrestricted right to kill, but finally public sentiment prevailed.

Chinchilla Rabbit

A native of the mountains of Bolivia and Peru, the Chinchilla squirrel is a difficult chap to catch, but so diligent has been the search for him to obtain his rare fur that the two countries banned export of the pelts. This inspired French breeders, with the result that they have produced rabbits with fur so closely resembling that of the South American squirrel as to baffle experts. The fur made a sensation in the London market in 1919, and now the Canadian Pacific Railway announces that on a farm in Saskatchewan George Jennings has carried on successful breeding of this rabbit.

Clocking the Road-Runner

How fast can the road-runner run was the question that bothered Carl R. Smith for a long time. Writing in *The Gull,* he testifies to having at last been able to check up on one without having it dart off into the roadside brush. Mr. Smith succeeded in getting one of these birds on the roadway on a bridge over the Salinas River, Calif. At a speed of twenty-six miles an hour by the automobile speedometer the bird took to the side rails but would stay at a speed of twenty miles without trying to dodge, even consenting to be forced to twenty-two. At the end of the bridge the bird turned off and stopped in the open, apparently not afraid or in any distress after its run, during which it did not resort to the use of its wings.

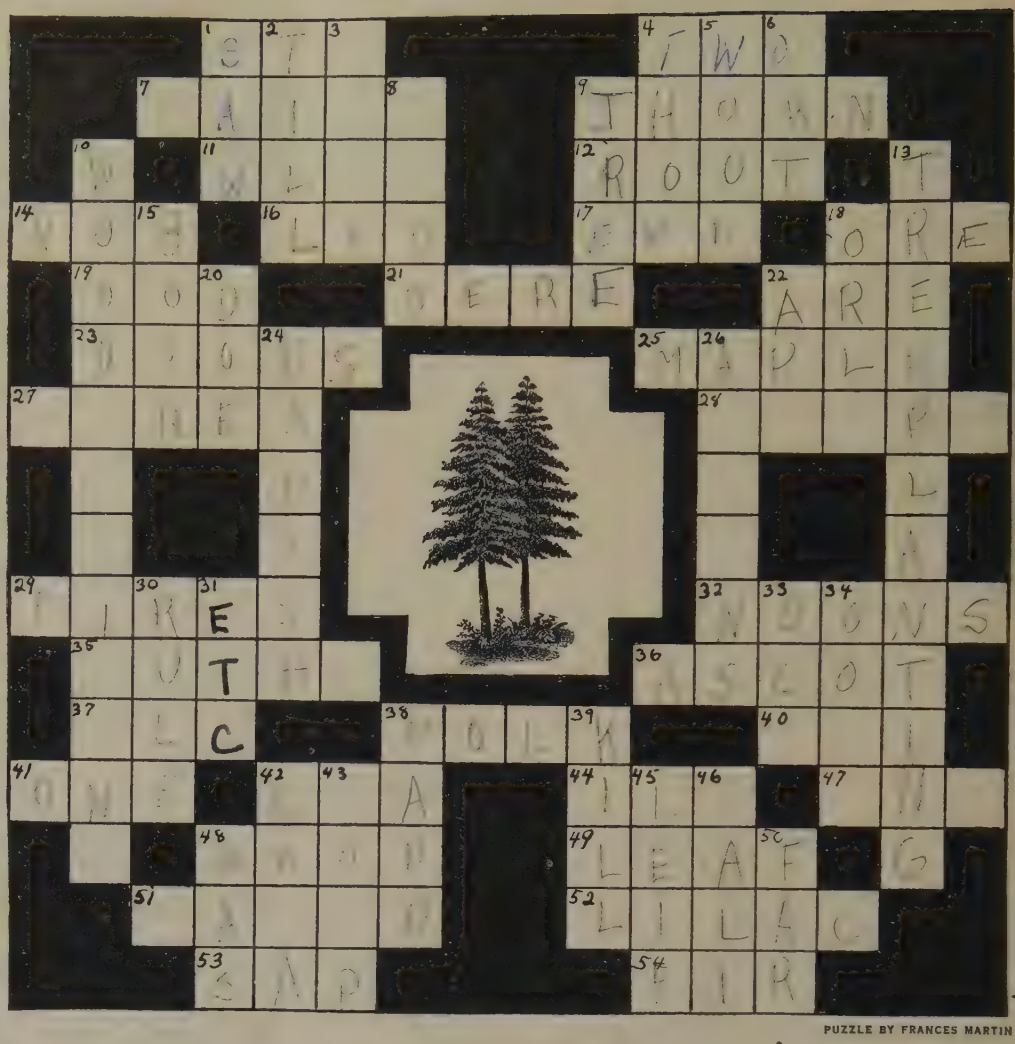
Not a Date Palm

On page 106 of the February issue of NATURE MAGAZINE there was a picture entitled, "Male Date Tree in Flower." This picture was mistitled through an error in the caption given it by the author of the article. It should have been labelled the California Fan Palm (*Washingtonia filifera*). This tree, though not closely related to the imported date palm, bears small date-like fruits and is often called Wild Date in California.

Mount Hood Playground

A new playground for the auto camper, the hiker and the mountain climber is made more available through the Mount Hood Loop Road now nearing completion, according to an announcement from the North Pacific District Office of the Forest Service. New trails have likewise been built in the Mount Hood National Forest, and it is expected that this section will be more readily accessible during the coming summer. It is anticipated, also, that a considerable winter playland will be opened up through these developments.

Another to Puzzle With



PUZZLE BY FRANCES MARTIN

ACROSS

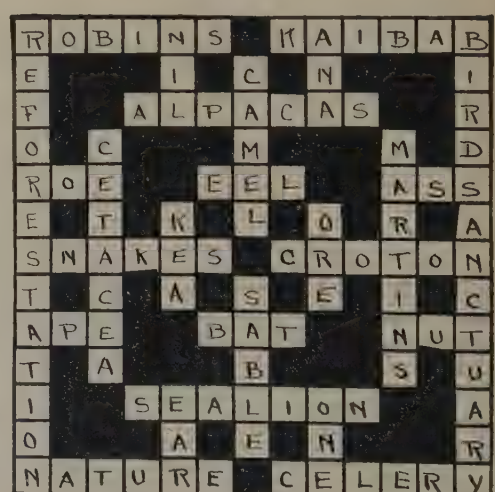
1—The Association that recruits the Tree-planting Army. (abbr.)
4—More than one.
7—Pertaining to the axis. (bot.)
9—A means of protection with which some plants and trees are endowed.
11—A character in the Bible.
12—The food reservoir of a tree.
14—Slang for head.
16—Constellation.
17—Not the beginning.
18—A gift Nature stores in the earth.
19—War. (scot.)
21—Withered, as of a leaf in the fall.
22—Form of the verb "to be."
23—Something to knock on made from trees.
25—A hardwood tree that yields a sweet by-product.
27—A sheath around the petiole. (bot.)
28—What the water does to reach the roots of trees.
29—The worst enemy of the forest.
32—Midday, several times.
35—Stump of a tree.
36—A place in England made famous by horses.
37—Young pig. (dial. Eng.)
38—A leader in the forestry movement.
40—Food in the Maori tongue.
41—Single.
42—Member Legislative Assembly. (abbr.)
44—Ill. (obs.)
47—The association you should join.
48—The trunks or large branches of trees prepared for commercial use.
49—The lungs of the tree.
51—Yew tree. (lat.)
52—A shrub with flowers of white or lavender.
53—The tree's blood.
54—Used at Christmas.

DOWN

1—A tool used for cutting trees.
2—To cultivate the earth.
3—Agalloch wood.
4—The. (obs. dative.)
5—Same as 48 across.
6—A fragment.
8—A man's name.
9—What you should plant.
10—A name given to tree planters by Theodore Roosevelt. (2 words.)
13—One of the most important activities for the welfare of the nation. (2 words.)
15—An ill-mannered fellow.
18—Margin, as on a shield.
20—Female deer.
22—An ancestor.
24—An early spring vegetable.
26—A small tree of the poplar species. (pl.)
30—To measure with.
31—And so forth.
33—A diminutive suffix.
34—A small Hawaiian bird.
38—A floating leaf of a water lily. (pl.)
39—What fire does to young trees.
42—A plant. (lat.)
43—Wolf. (French.)
45—Leaf. (obs.)
46—Tropical tree.
48—Form of the verb "to be."
50—Not near.

The answer to this puzzle will be printed in the May issue.

Answer to the March Puzzle


ROBINS MAIBAB
E I C N I
F ALPACAS R
O C M M D
ROE EEL NS S
E T K L O R A
SNAKES CROTON
T C A S E I C
APE BAT NUT
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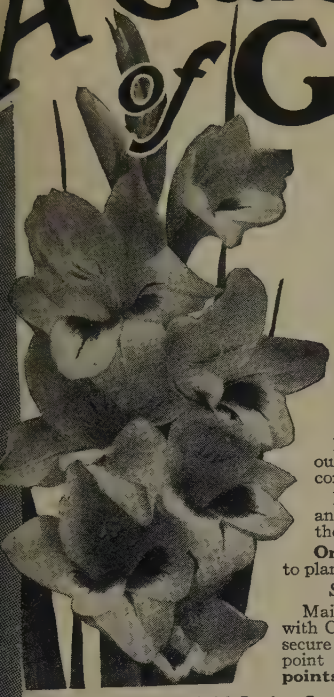

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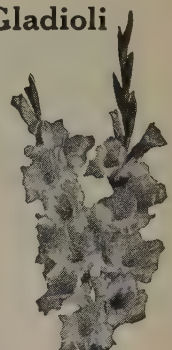

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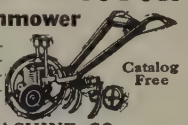

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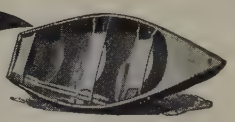

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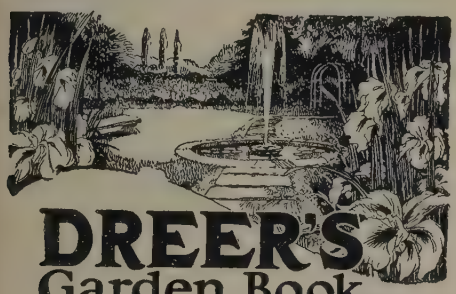

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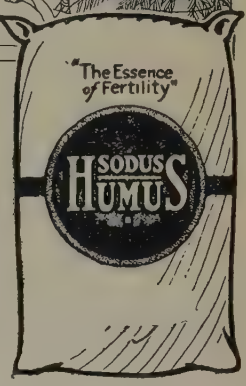

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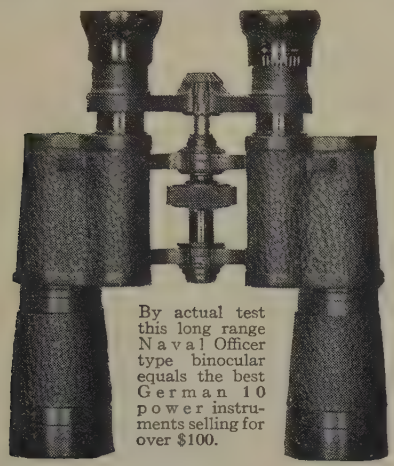

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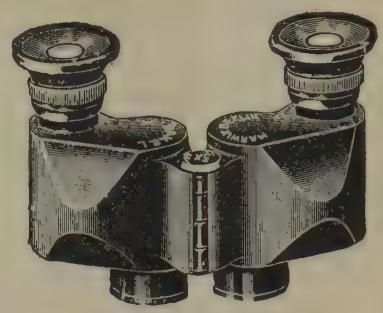

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Another State

Vermont has joined the ranks of the states cooperating with the Federal Government in forestry through the passage of an enabling act for the acquisition of National Forest area in that state. Robert M. Ross, State Forester, looks forward to the day when the Green Mountains will boast a National Forest of two or three hundred thousand acres.

Recreation Conference

The second annual meeting of the National Conference on Outdoor Recreation will be held in Washington, D. C., on May 28, 29 and 30. Details of the meeting, including the program, have not yet been completed but will be announced later. Both the American Nature Association and the American Tree Association are members of the conference.

The Cardinal at Home

Commenting on Ernst Keil's article on winter bird guests, Mr. W. C. Egan, of Egandale, Highland Park, Ill., makes the following interesting observation:

"I have had a pair of cardinals winter and summer. They feed on a table in plain sight of my dining-room window. During the mating season he is a devoted lover. He will sit on the edge of the feeding box and after devouring three or four sunflower seeds, will carry a seed to Mrs. Cardinal, who demurely sits on the table some three feet away. He repeats this performance several times but always takes care to get his three or four seeds to her one. Once when she had flown to an adjoining tree he carried a seed to her. When the mating season is over he changes his tactics and drives her away if she comes to the table when he is there. As a consequence after trying it a few times she remains on the ground hunting for any seed that may have fallen there, until her lord and master has had his fill and flown away."

Idaho Acts

In order to crystallize action in the state to take advantage of the provisions of the new McNary-Clarke Forestry Act, an all-Idaho committee has been formed to work out a forest policy for the state in line with the provisions of the Act and the needs of Idaho. This committee numbers 14 and is representative of the North Idaho Chamber of Commerce and the South Idaho Commercial Clubs.

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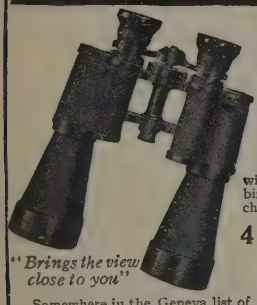

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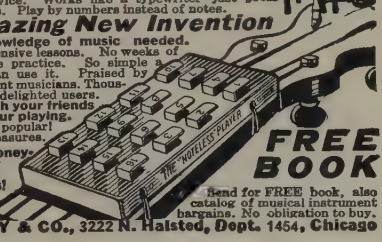

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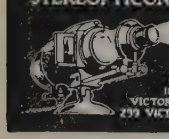

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State Park Meeting

Selection of Skyland, Va., within the confines of the proposed new Shenandoah National Park, has been announced as the meeting place of the fifth annual meeting of the National Conference on State Parks to be held May 25 to 28. The meeting will stress the important factor that the increasing state park movement is becoming in recreation and the mechanics of state park work will be taken up.

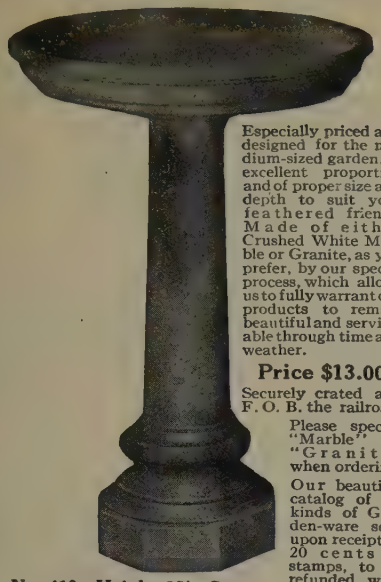
Nature and Health

Nature study forms the basis of approach to many of the health topics in a little volume entitled "Health for Every Day," written by Maurice A. Bigelow and Jean Broadhurst and published by Silver, Burdett and Company. It is a book on personal health admirably adapted for school use as a textbook in this field. It is notably free of some of the grisly illustrative material found in many of the health textbooks. Rather than imparting a knowledge of health requirements through inspiring fear in the child, as in the case in some of these volumes, this little book seeks to teach through both attractive illustration and entertaining text. It would not harm many adults to read it, either.

Elements of Conservation

Growing discussion is being given to the need of teaching conservation in the elementary and secondary schools in order that the coming generation may be equipped to meet the pinch of past prodigality. Seemingly in anticipation of this need, Mr. Garrard Harris, of Birmingham, Ala., has written a volume entitled "Elements of Conservation" and published by the Johnson Publishing Company of Richmond, Va. His book is not a scientific treatise. Instead it is a straightforward and comprehensive statement of the situation with respect to our natural resources and what conservation must do to

The "Bob-o-link" Bird Bath



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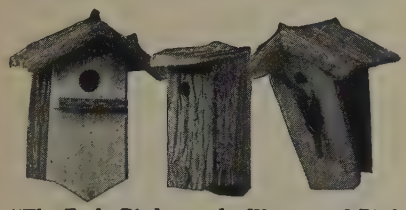

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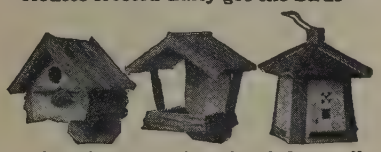

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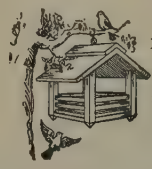

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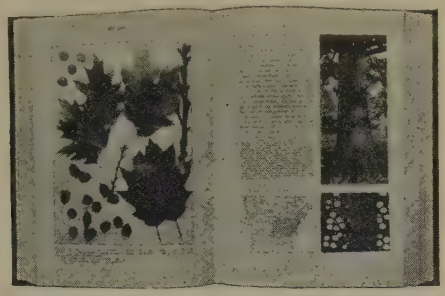

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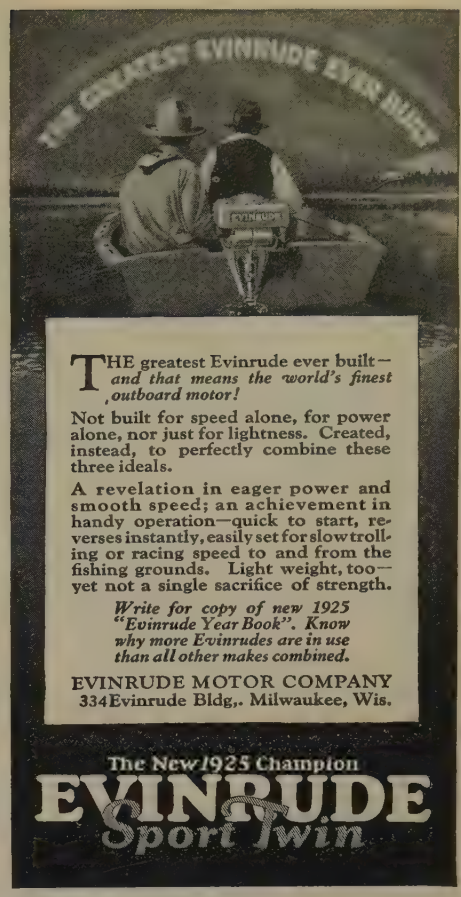

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this is the Baseball Field (a home run)
these are FIELDS where blueberries and golden-rod grow
this is the Garage for Billy
this is the Basketball Court
these are the Tennis Courts
Raspberry bushes where balls get lost
flower girls
the flag
this is
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this is the BUNGALOW
this is the DINING ROOM and KITCHEN
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this is the BUNGALETTE
and this the BUNGLE
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this is the
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the dock
the canoe float
these are rowboats
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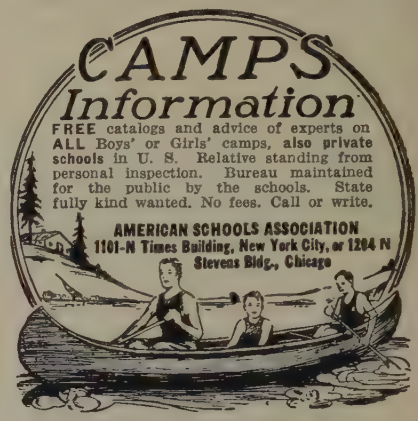
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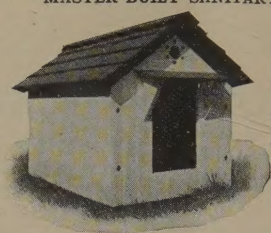

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THE TREE PLANTING ARMY

Put Forestry Facts before people during American Forest Week

—Charles Lathrop Pack, President, American Tree Association.

Now that plans for marking the two hundredth anniversary of the birth of George Washington in 1932 have been put under way by President Coolidge, The American Tree Association calls on the tree-planting army to join in that celebration by planting Washington Elms in honor of the Father of His Country. Some time ago the Washington Elm at Cambridge, Mass., was taken down because of its condition, due to old age. This tree was one of the first to be nominated for a place in the Hall of Fame for trees with a history that is being compiled by the Association. The American Tree Association will list a special honor roll of all who plant Washington Elms. The Association also urges that the tree planters begin planting the elms right now so that schools, clubs, women's organizations will have a rallying point for their observance exercises in 1932. The tree, of course, will have the advantage of that much growth.

American Forest Week, which comes April 27, will be more widely observed this year than ever before. The date coincides with National Garden Week of the General Federation of Women's Clubs, two days of which are devoted to tree-planting and reforestation themes in the schools and by the clubs in the Federation. This week inaugurated by the late President Harding is of the greatest educational value. At the annual meeting of the Berks County Conservation Association at Reading, Pa., Charles Lathrop Pack, president of The American Tree Association, pointed out the need of educating the American people to the importance of reforestation. The important thing, he said, is to get facts on the situation before the people.

The first club tree planting of the year to be registered with The American Tree Association was that of the Adams County Women's Clubs of Natchez, Miss. In this state the various clubs have joined in a campaign for tree planting in which every tree must be registered on the Association's honor roll in order to be counted in the award of prizes.

Boy Scouts are particularly active in tree planting this year. At Macon, Ga., and Memphis, Tenn., reforestation programs at large camp sites are under way. In the hundreds of summer camps this year reforestation and tree planting will be made part of the camp work.

In Massachusetts 5,000 trees will be planted on Constitution Hill near Lanesboro. The Massachusetts Forestry Association will direct the Boy and Girl Scouts in this work. At Saratoga Springs and Gloversville, N. Y., the Boy Scouts have registered in the tree-planting army.

The first college to report tree planting this year is Tabor College at Hillsboro, Kans.

The Youngstown Women's Clubs will complete a Road of Remembrance tree planting outside that city.

According to the figures compiled by Willis A. Sutton, superintendent of the Atlanta schools, the school children of that city planted 5,757 trees on Arbor Day.

Plans for tree planting along the ocean boulevard from Jacksonville to Miami are being mapped out by women's clubs along the route.

In honor of Theodore Roosevelt, Boy Scouts Troop 101 of Northampton, Mass., planted a Maple tree. The tree was the gift of Charles E. Childs. In Indianapolis the Boy Scouts planted silver birches in honor of Roosevelt and dedicated the grove to his memory.

By working after school Mac and John Hall, of Warrensburg, Va., earned enough money to invest in 5,000 white pine transplants which they set out on five acres of their grandmother, Mrs. Janet Simmons. G. Ernest Woodward is advising the boys.

The Southern Methodist University at Dallas has a memorial tree-planting campaign under way. The trees are to be planted along Bishop Boulevard from Mocking Bird Lane to Dallas Hall.

At the direction of Mrs. C. F. Erwin, of Harbor Springs, Mich., the club women are planning to plant and mark several roads in that state.

Miss Roslyn of the Junior Musicale Club of Jacksonville, Fla., registers the Arbor Day planting of that organization with the American Tree Association.

Mrs. Frances E. Whitley, of Webster City, Iowa, has sent the Association's printed matter through all her clubs of the State Federation for American Forest Week.

The only way to join The American Tree Association is to plant a tree and register it with the Association, 1214 Sixteenth Street, N.W., Washington, D. C. The Association will send tree-planting suggestions and a tree-day program for two cents to pay postage.

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